

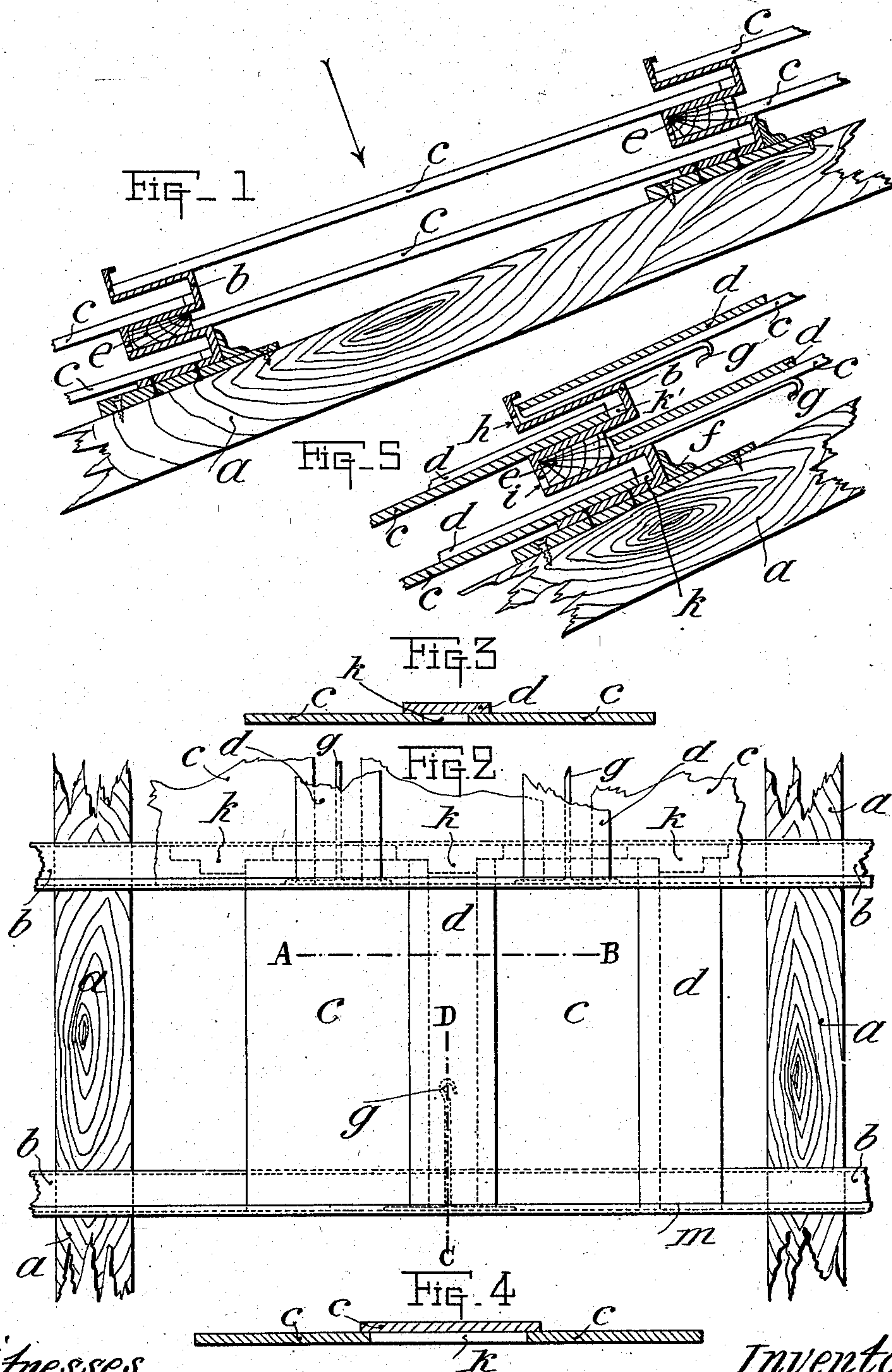
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A. TASSAIN.
GLAZING CONSERVATORIES, HOTHOUSES, &c.
APPLICATION FILED JUNE 4, 1901.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses,

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2 SHEETS—SHEET 2.

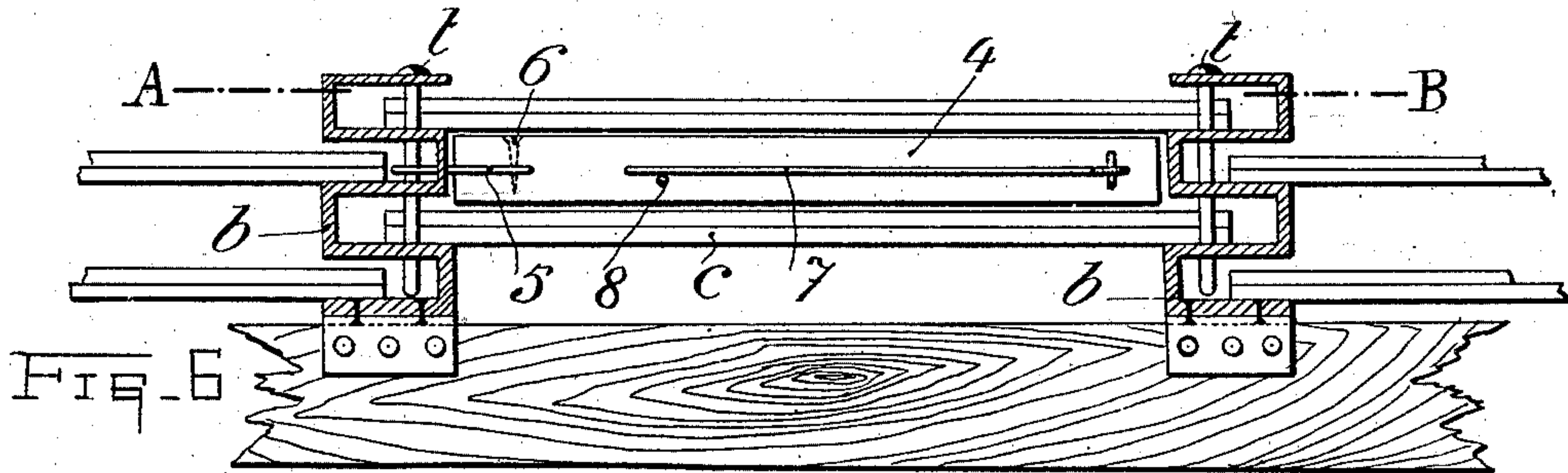


Fig. 7

Fig. 8

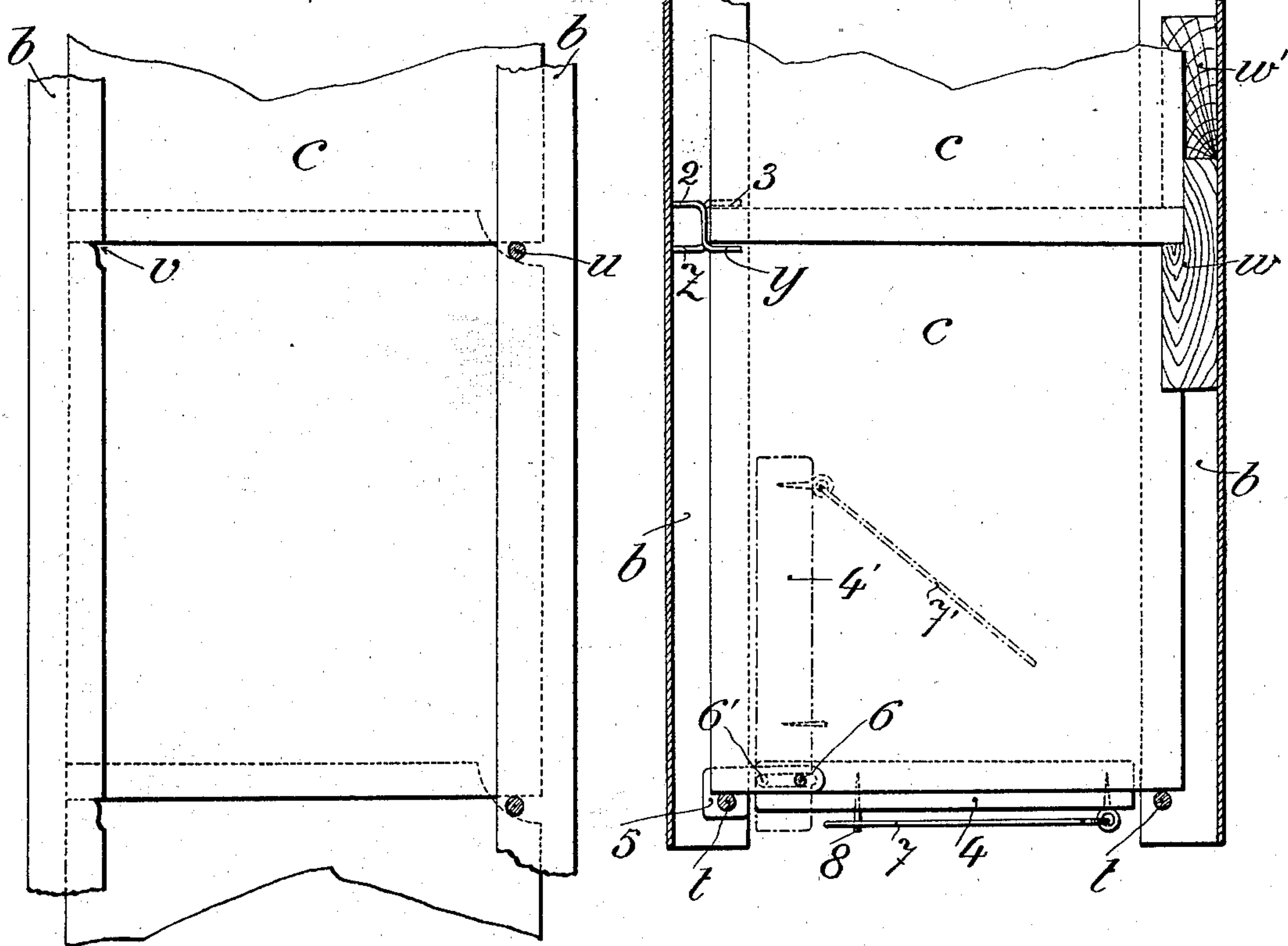
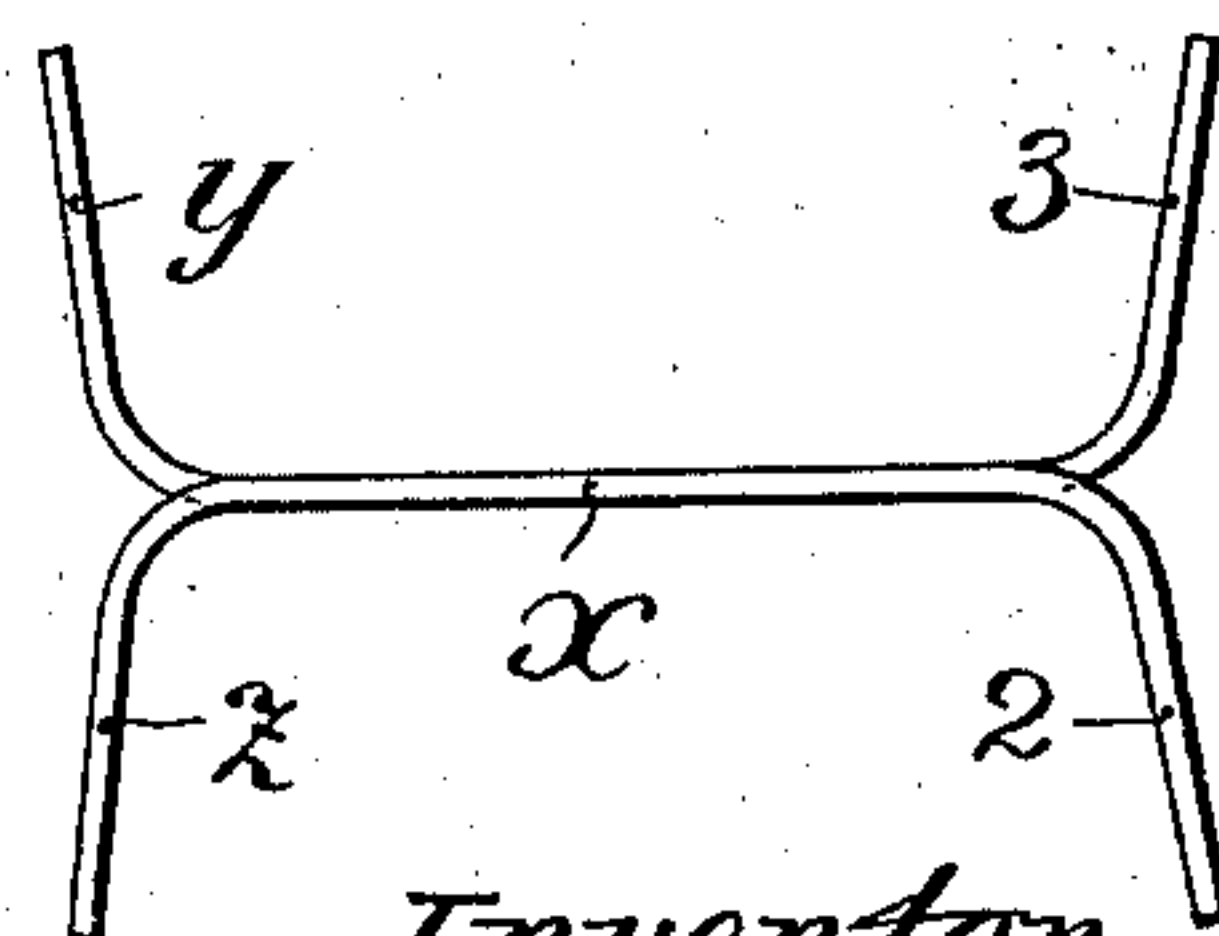
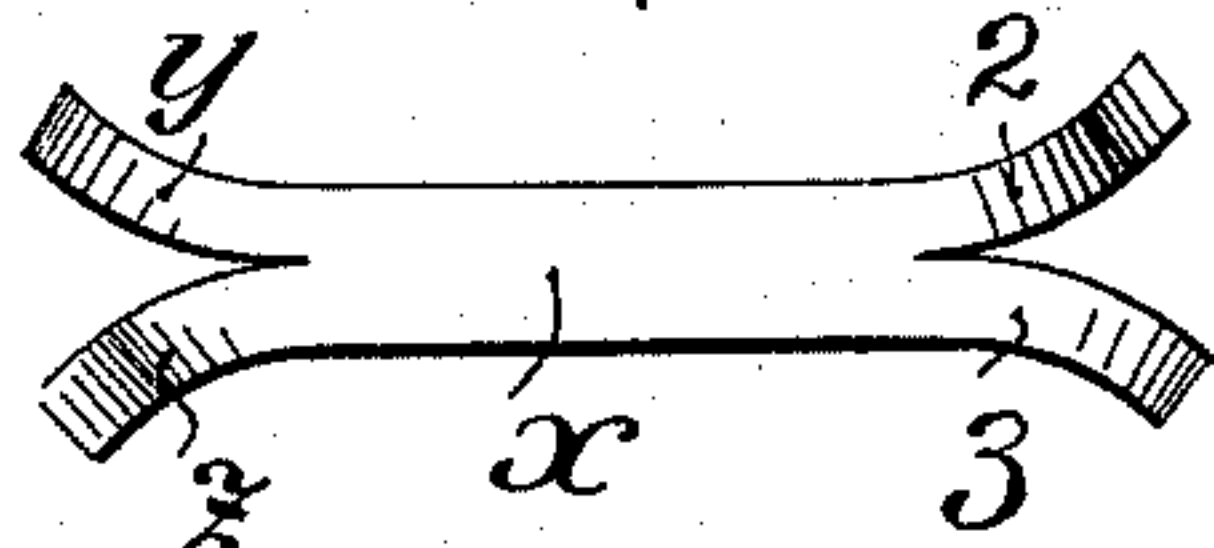
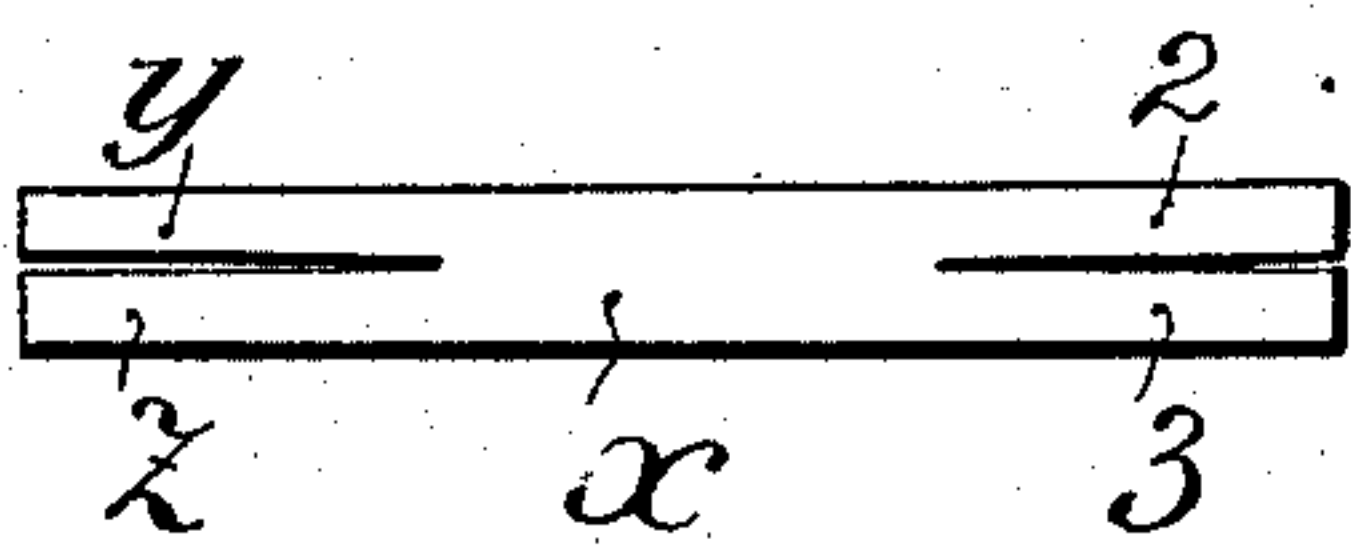


Fig. 9



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UNITED STATES PATENT OFFICE.

ACHILLE TASSAIN, OF PARIS, FRANCE.

GLAZING CONSERVATORIES, HOTHOUSES, &c.

SPECIFICATION forming part of Letters Patent No. 719,903, dated February 3, 1903.

Application filed June 4, 1901. Serial No. 63,162. (No model.)

To all whom it may concern:

Be it known that I, ACHILLE TASSAIN, a citizen of France, residing at 1 Rue d'Edimbourg, Paris, France, have invented certain
5 new and useful Improvements in Glazing Conservatories, Hothouses, and Like Structures, of which the following is a specification.

My invention relates to the art of single
10 glazing for halls, pavilions, shelters, portable frames, and the like or of multiple glazing for conservatories, hothouses, and the like whereby I am enabled to use thick glass (St. Gobain glass) and to secure the panes rapidly
15 without the use of putty and without having to remove any part of the structure.

I will describe my invention as applied to double glazing.

The present method of double glazing as
20 commonly practiced consists in the use of wooden frames in which the panes or panels of glass engage each other successively and are held in place by means of putty. These grooved frames not being intended to sup-
25 port a heavy weight, the glazing is therefore usually of ordinary window-glass, which breaks very easily, and it is difficult to replace a broken pane or panel without removing all those which are below it in the same
30 row. Furthermore, when a forcing-frame or a low greenhouse, the roofing of which is always inclined to permit rain-water to flow off, has to be re-covered or roofed, some difficulty arises when fitting in from the bottom panes
35 or panels of a certain length, and the use of short panes increases the number of joints to the detriment of the tightness of the structure.

My present invention is designed to obviate all these defects, and in order that it may be readily understood I will describe it fully with reference to the annexed drawings, in which—

Figure 1 is a partial vertical section of a
45 roofing constructed according to my invention. Fig. 2 is a plan taken in the direction of the arrow, Fig. 1. Fig. 3 is a section taken on the line A B of Fig. 2. Fig. 4 shows a modification. Fig. 5 is a section, on a larger
50 scale, through the line C D, Fig. 2. Figs. 6 to 9 show a modified arrangement. Fig. 6 is

an end view of a portion of the covering or roofing lying between two irons. Fig. 7 shows in plan two ways of fixing the panes or panels. Fig. 8 is a section on the line A B of Fig. 6,
55 showing two other ways of fixing. Fig. 9 shows a clip.

In the figures, *a* indicates the rafters of the framing which support the glass panes or panels. On these rafters I fix specially-
60 shaped irons *b*, either parallel to the line of the top ridge, Figs. 1 to 5, or perpendicularly to such line, Figs. 6 to 9. As seen on a larger scale in Fig. 5, the irons *b* are formed by bending several times on itself at right
65 angles a strip of sheet metal which is thicker at one side (four to five millimeters) than at the other side (one millimeter)—that is to say, a strip which tapers transversely or is wedge-shaped. I thus obtain an iron form-
70 ing several contiguous U-shaped recesses alternately arranged on opposite sides of the iron, the depth of each bend being equal to fifty millimeters.

Referring first to Figs. 1 to 5, the glass
75 panes or panels which are to form the upper covering or roofing are a little longer than those which are to form the lower covering or roofing. If we call *L* and *L'* these lengths, the irons *b* should be apart one from the other
80 from axis to axis an amount equal to *L'*. If, for example, the lower panes or panels are of a length equal to ninety-six centimeters, the upper panes or panels will be one meter and the distance apart of the irons ninety-six
85 centimeters.

The fixing of a pane or panel is an exceedingly simple operation. All that has to be done is to insert it far enough into the de-
90 sired bend of one of the irons *b* to permit the opposite side to be brought up to and inserted in the bend of the corresponding iron. Given the above dimensions, this operation is possible with all the panes or panels.

c indicates the different panes or panels.
95 At the bottom of each of the bends which receive the lower edge of the lower panes or panels I insert a wooden packing-strip *e*, which is necessary to compensate for the difference in length of the panes or panels. This
100 packing-strip is of a width equal to *L L'*—say four centimeters—in the example chosen.

In order to cover the joint which of necessity exists between two adjacent panes or panels, various arrangements may be adopted. I will describe two which I prefer and which are shown in section in Figs. 3 and 4. As shown in Fig. 3, the joint is covered by a pane or panel *d* of the same length, as further shown by Fig. 2, as the panes or panels *c*, but much narrower, while according to Fig. 4 the panes or panels *c* are separated for a distance equal to their width, and this wide joint is covered by a third pane or panel *c*. In order to close up the open space between two adjacent panes or panels *c* and the cover-joint *d*, Fig. 3, or *c*, Fig. 4, and to render the panes or panels completely rigid, I arrange between two adjacent panes or panels and at their upper part a T-shaped packing-strip *k*, Fig. 2, of wood or iron of the same thickness as the panes *c*. The arms of this T-shaped strip have in the example chosen a width equal to one-fourth *L L'*—say one centimeter. It will be readily understood that the packing-strips *k* can be used indifferently for the two rows of glass.

The irons *b* are eight to ten meters long, so as to reduce the number of joints between the irons; but these joints are not of serious inconvenience if care be taken that they do not coincide with a joint between the panes or panels.

f, Fig. 5, indicates an angle-iron used in securing the irons *b* in position.

To allow air to pass into one or other of the glazings, it is only necessary to slightly shift one of the pane-joints *d*, which is easy, since these panes are not fixed by any fastening. To facilitate the operation of moving the pane *d*, I place under each of them a small metal strip *g*, bent up at right angle, and by pulling this strip I start the movement of the panel, then continue it by hand.

The irons are provided with holes *h i* at the bottom of the bends to allow water of condensation, dew, &c., to run off. In the case of rain-water this easily runs over the slight obstructions formed by the upper parts of the irons *b*, the width being slight.

Figs. 6 to 9 show an arrangement in which the irons *b* are parallel to the rafter *a*, and hence perpendicular to the ridge-line. If, for instance, the irons *b* are fifty centimeters apart, panels of forty-seven centimeters wide and of any length could be employed. To fix a panel, it is inserted on the one side into the desired bend of one of the irons *b*, and then the opposite side is brought into the corresponding bend of the adjacent iron. The lower panels *c* in each row are held in place by two copper or brass pins *t*. The successive panes may be held in place in various ways. For instance, pins *u*, Fig. 7 on the right, may be inserted for all the panes, and in this case in order to leave room for the pins *u* it is sufficient to cut away the upper angles of the panes or panels, as shown, or the

irons may be formed with a notch *v*, Fig. 7 to the left, which will retain the upper pane without obstructing the flowing off of the water.

Wooden packing-strips *w w'*, Fig. 8 to the right, formed with a notch, may also be employed and be forced between the glass and the adjacent face of the iron *b*. The next pane bearing against the notch, all the panes are held firmly and cannot be displaced in any direction. The mode of fixing which I, however, prefer is that shown in Fig. 8, left-hand side. It consists in employing a special clip (shown on an enlarged scale in Fig. 9) and formed of a zinc or brass strip *x* of a width equal to the double thickness of the panels. In this strip I cut two slits, forming four tongues *y z 2 3*, and bend these latter in contrary directions, as shown in Fig. 9. These clips are placed as shown in Fig. 8, the tongues *z* and *2* embracing the bottom of the bend of the iron *b*, the tongue *3* catching onto the already-fixed panel and the tongue *y* holding the next pane.

To close the space between the two roofs or layers of glass, I provide wooden shutters *4* of a depth equal to the distance between the two layers of panels and of a length equal to the internal distance between the irons *b*. These shutters have a slit at one end, and into said slit enters a metal plate *5*, fixed by the pin *t* and provided with a slot *5^a*, Fig. 8, in which a stud *6*, carried by the shutter *4*, is free to work. A rod *7*, which rests normally on a peg *8*, serves to operate the shutter *4* to bring it from the position *4* in the position *4'*, and vice versa. A like shutter is arranged at each end of each row of panels.

It is obvious that three or a greater number of layers of glass may be employed by increasing the number of bends in the irons *b*. This may be found useful for cold countries.

What I claim is—

1. In conservatory, hothouse and like constructions, supports for the glass panes having the shape in cross-section of reversely-coupled **U**'s whereby to afford alternate reversely-arranged recesses, of which adjacent recesses have a common wall.

2. In conservatory, hothouse, and like constructions, parallel supports for the glass panes having the shape in cross-section of a series of reversely-coupled **U**'s whereby to afford alternate reversely-arranged recesses, adjacent recesses having a common wall and two or more of such recesses being located on each side of said supports.

3. In conservatory, hothouse, and like constructions, supports having in cross-section the shape of a series of reversely-coupled **U**'s, whereby to provide alternate reversely-arranged recesses, adjacent recesses having a common wall and two or more of said recesses being located on each side of said supports, and the supports being arranged in

parallel relation at such distance apart that panes of glass may have opposite sides inserted and secured in the corresponding recesses of adjacent supports.

5 4. In conservatory, hothouse and like constructions, supports for the glass panes, panes of glass having opposite side edges resting on said supports, the ends of said panes overlapping, and clips located at the points where
10 said panes overlap, each of said clips comprising a strip of metal having at each end prongs projecting from opposite sides thereof, prongs on the same side of the strip lying in
15 different planes, and one set of said prongs being adapted to engage the support and the

other set the respective edges of said overlapping panes.

5. A clip for engaging the overlapping edges of glass panes in hothouse and similar constructions, comprising a strip of metal 20 having its opposite ends slit longitudinally and the resultant prongs bent at right angles to the clip in contrary directions.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses. 25

ACHILLE TASSAIN.

Witnesses:

EDWARD P. MACLEAN,
ALFRED FREY.