

No. 884,208.

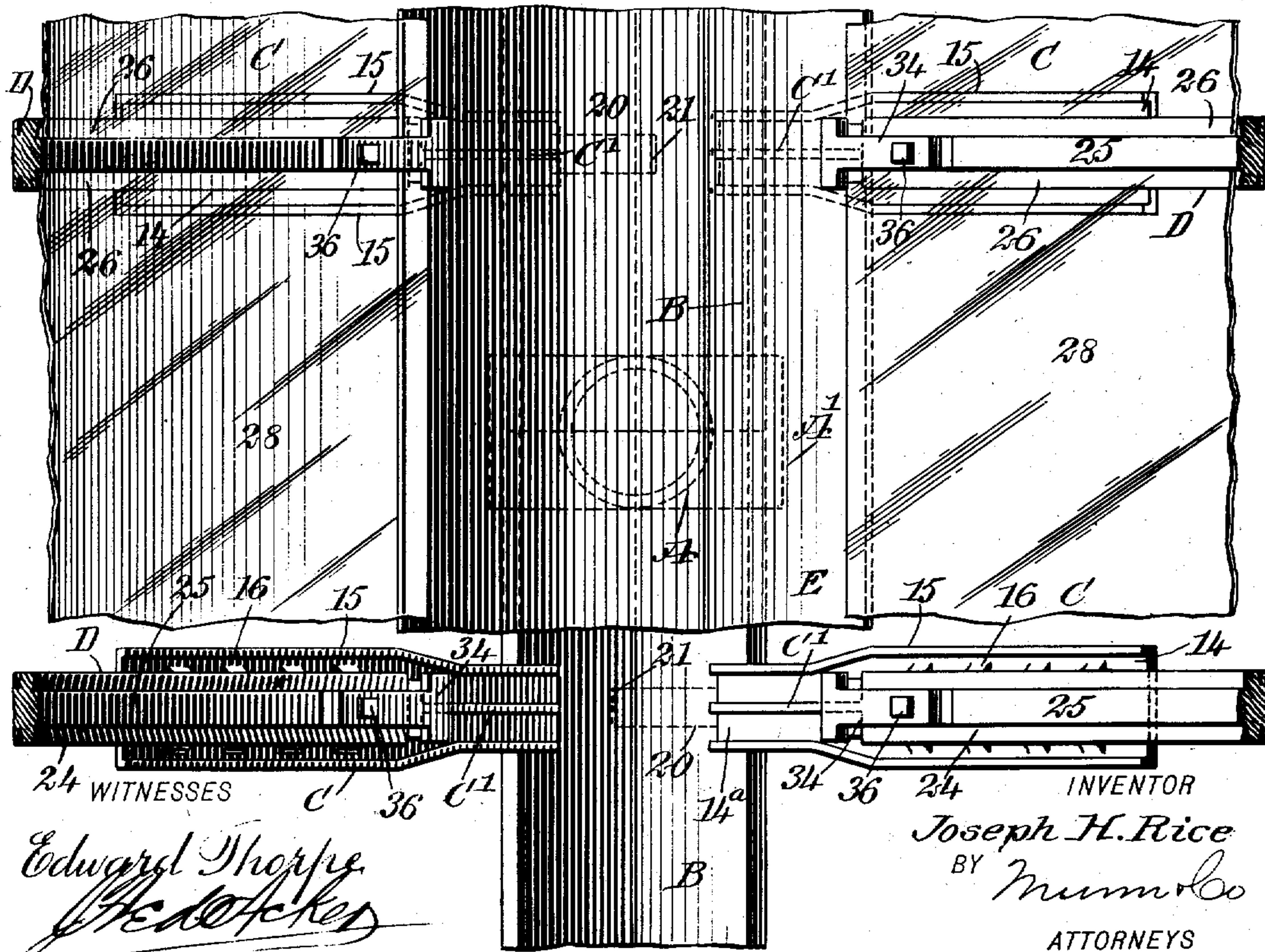
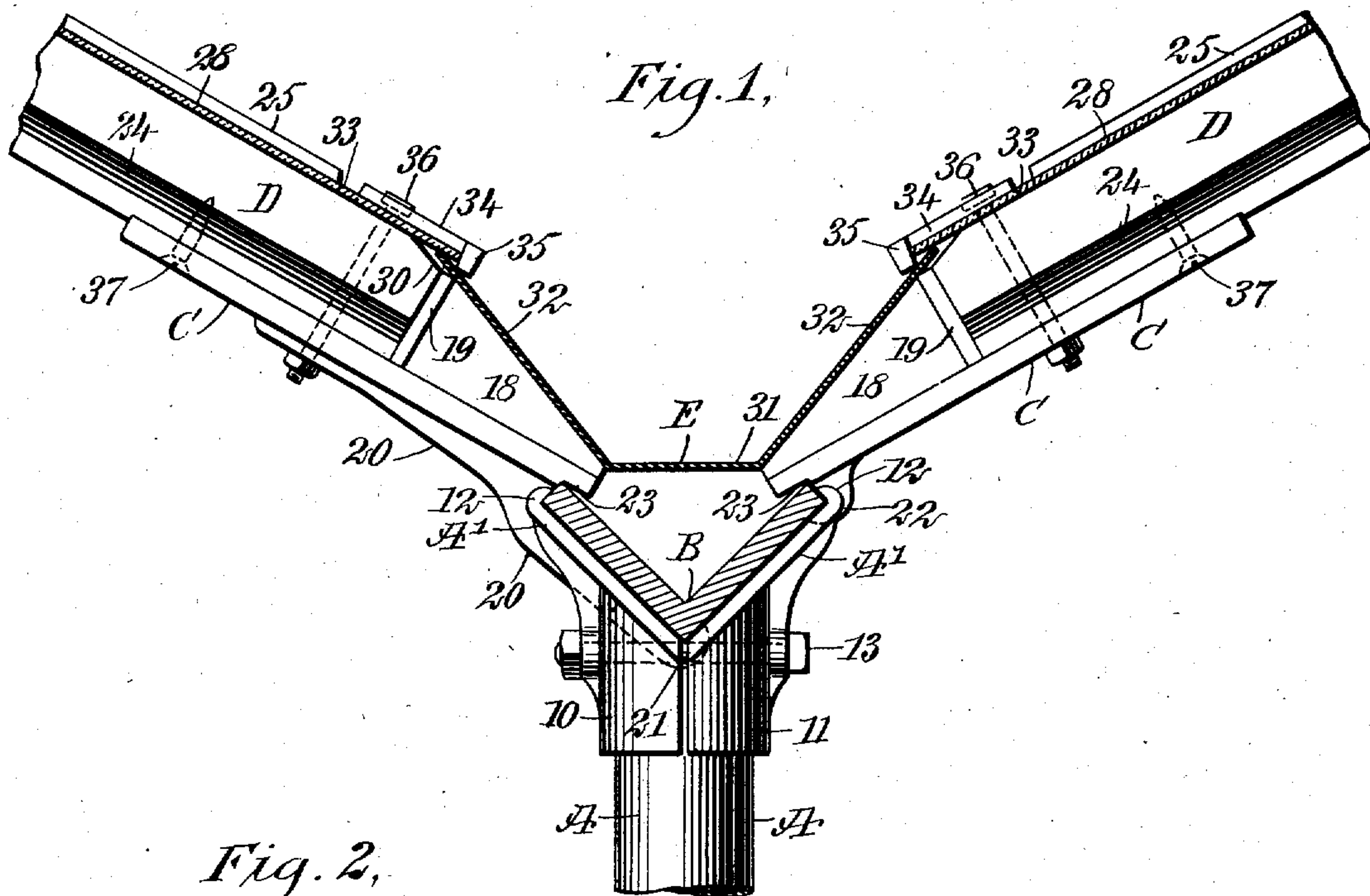
PATENTED APR. 7, 1908.

J. H. RICE.

GREENHOUSE CONSTRUCTION.

APPLICATION FILED JAN. 10, 1907. RENEWED FEB. 8, 1908.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3,

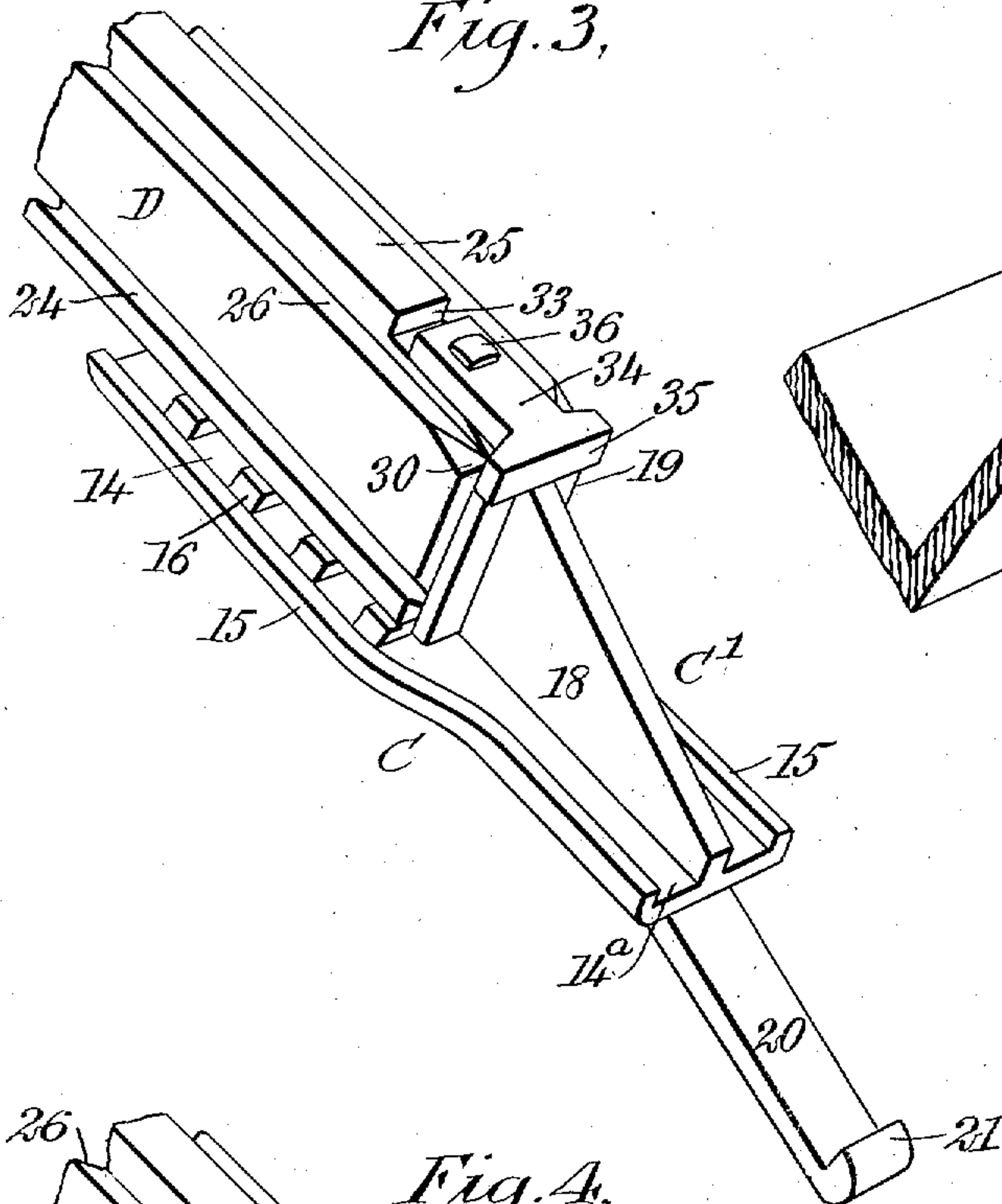


Fig. 5,

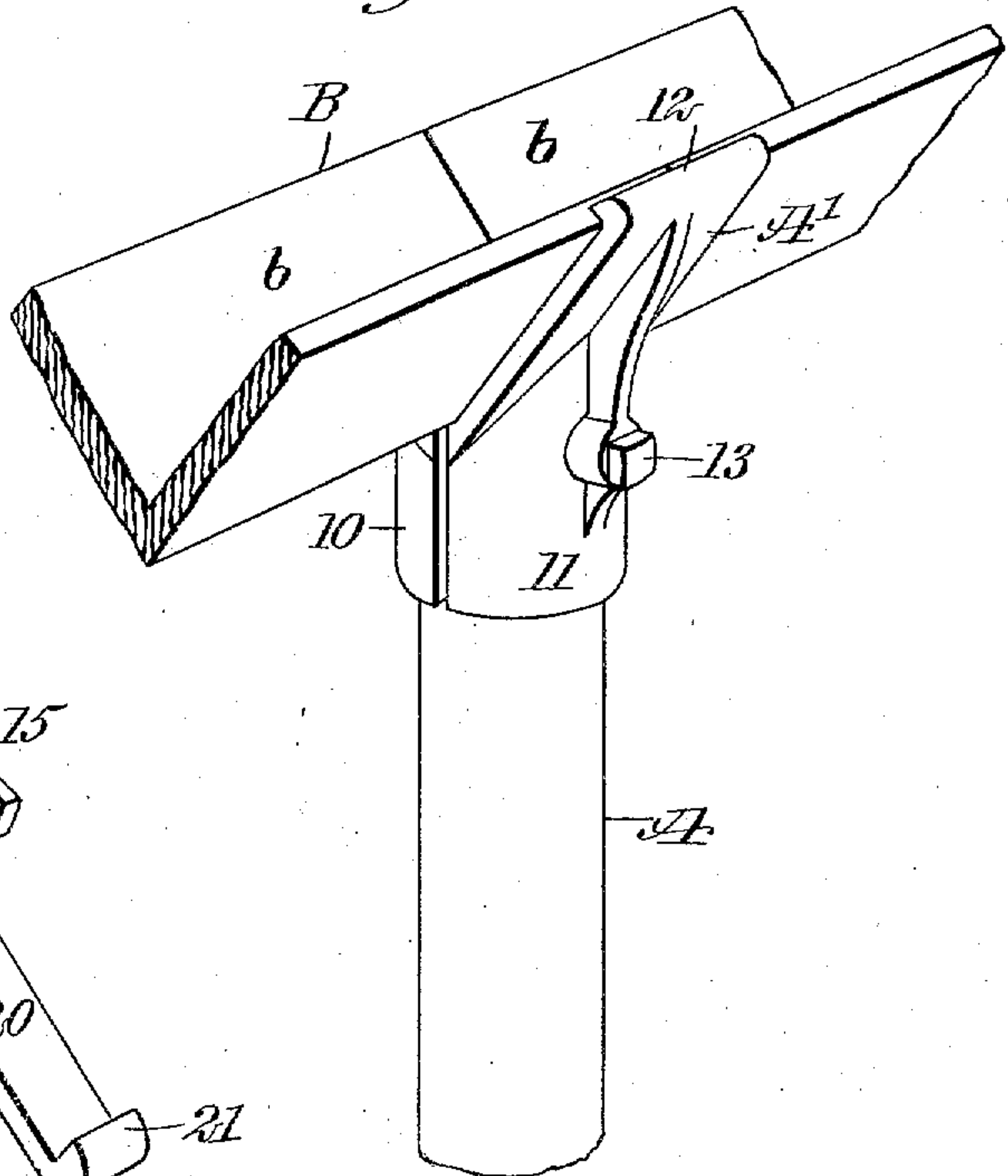


Fig. 4,

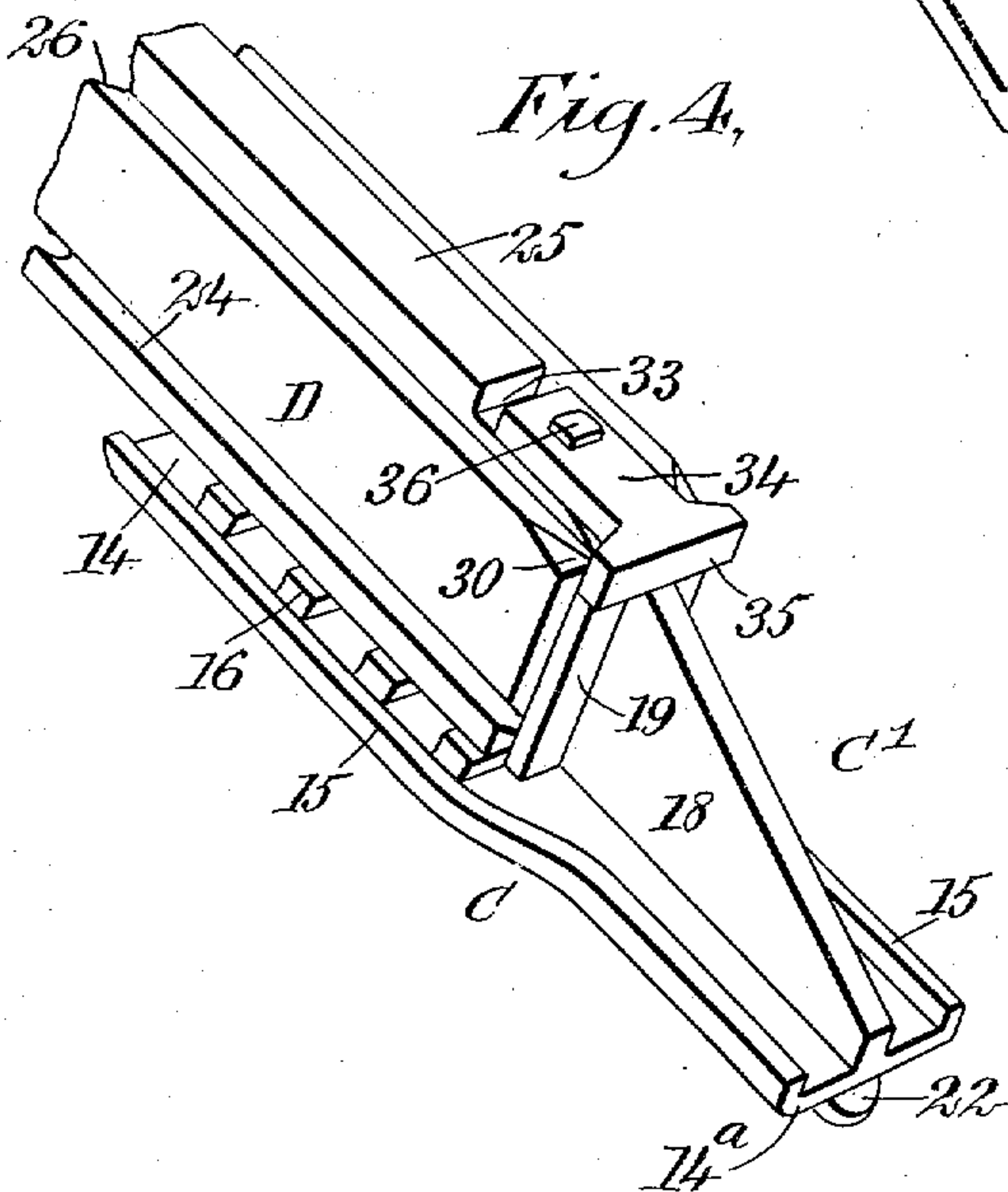
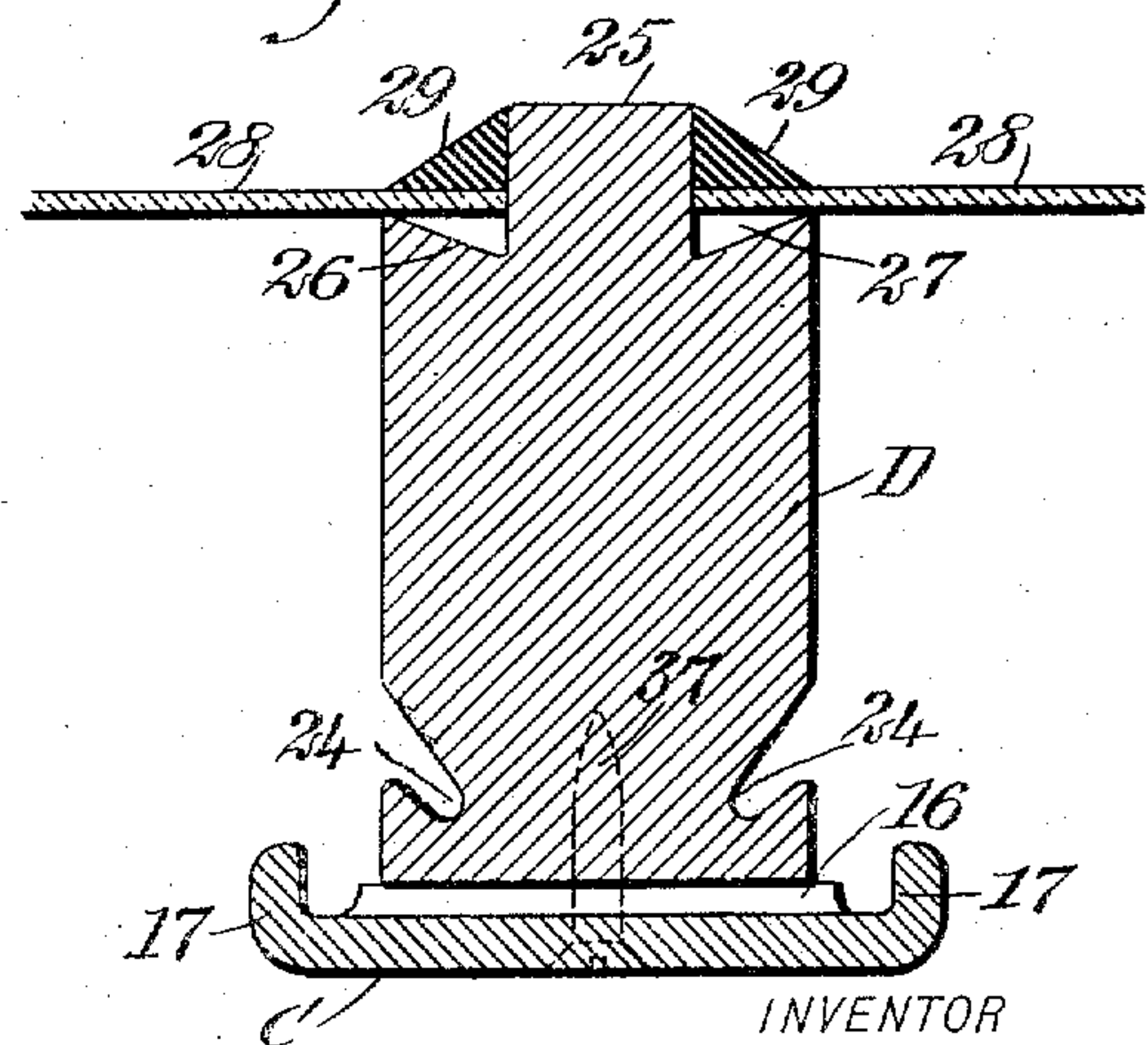


Fig. 6.



WITNESSES

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UNITED STATES PATENT OFFICE.

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GREENHOUSE CONSTRUCTION.

No. 884,208.

Specification of Letters Patent.

Patented April 7, 1908.

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To all whom it may concern:

Be it known that I, JOSEPH HULBERT RICE, a citizen of the United States, and a resident of Ashtabula, in the county of Ashtabula and State of Ohio, have invented a new and Improved Greenhouse Construction, of which the following is a full, clear, and exact description.

The purpose of the invention is to provide a construction of greenhouse wherein a heavy supporting girder for the roof is in the form of a gutter, acting as a secondary gutter to carry off the drippage or condensations on the inner face of the roof, and to so arrange said girder that it is not exposed to the changes of the weather, being at all times surrounded by the heated air within the structure.

A further purpose of the invention is to locate an outer or main gutter over the secondary gutter yet independent thereof, which main gutter is adapted to carry off the water from the exterior of the roof, said main gutter being made of sheet metal so that at times when snow and ice collect upon the roof the same will be quickly melted owing to the heating of said main gutter by the hot air within the greenhouse.

Another purpose of the invention is to construct the gutters in sections and with yielding and overlapping connections, whereby to prevent them from separating or buckling under expansion and contraction.

A further purpose of the invention is to provide bracket supports for the sash or rafter bars, so constructed that they keep the foot sections of the rafter bars out of the range of all moisture which is always present adjacent to greenhouse gutters, the said brackets also serving to lock the roof system to the gutter-shaped girder.

Another purpose of the invention is to provide for a quick release of moisture from the sash or rafter bars, and to provide clamps for the said sash bars that serve as abutments for the lower edges of the panes of glass adjacent to the gutter, and as means for holding the sections of the main gutter in position.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth and pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference

indicate corresponding parts in all the figures.

Figure 1 is a vertical section through the central or depressed portion of the roof of the structure; Fig. 2 is a plan view of the same portion of the structure; Fig. 3 is a perspective view of the inner or foot end of a rafter or sash bar and a bracket therefor; Fig. 4 is a view similar to that shown in Fig. 3, and illustrates a slightly different construction of bracket; Fig. 5 is a perspective view of a portion of the supporting girder and one of its supports; and Fig. 6 is an enlarged vertical section through a sash bar or rafter, panes of glass supported thereby and the bracket support for the bar.

A represents one of the main pillars or posts for the central portion of the structure, being preferably tubular, and A' represents one of the saddles for said pillars. As illustrated these saddles are V-shaped in general formation, and are made in two sections, each main section of a saddle being provided with a lower collar member, designated respectively as 10 and 11, which collar members are adapted for engagement with the outer face of a pillar A, and the sections are held together and clamped to the said pillar by means of a bolt 13, which is passed through the collar members 10 and 11, and which may also be passed through the pillar; but usually the bolt 13 is simply made to engage with the upper end of the pillar, and each member of the saddle A' at its upper end is provided with an inwardly-extending transverse flange 12.

The supporting girder B, or the girder which carries the roof system is made to rest in the saddles A' of the posts or pillars A; and the flanges 12 of the saddles engage with the upper edges of said girder B, which girder is V-shaped in cross section so as to constitute a gutter. The said girder B is constructed in a suitable number of sections b, which sections may be at the saddles A' and may abut or overlap, or have an expansible connection so that the sections of the girder will not separate or buckle under expansion and contraction.

The girder B is adapted to support a number of brackets C, said brackets having an upward and outward inclination from the side portions of the girder as is shown in Fig. 1. Each bracket consists of a body section 14 that is flat and of suitable length,

the end 14^a of the body being preferably contracted as shown in Figs. 3 and 4. The said body 14 is provided with upwardly-extending side flanges 15 and its wider portion with transverse lugs 16 upon its upper face, spaces 17 intervening between the ends of the lugs 16 and the flanges 15 so as to provide for an uninterrupted passage for water received by the brackets, resulting for example from condensation upon the panes of glass to be hereinafter mentioned.

An angle web C' is formed at the inner or contracted end of each bracket C, and each web C' consists of a substantially triangular body section 18 that extends from the contracted end of a bracket centrally and longitudinally thereof nearly to the innermost lug 16, as is shown in Figs. 3 and 4, and a transverse head member 19. This head member 19 serves as an abutment for the inner end of the sash bar or rafter D that the bracket is adapted to support.

One set of brackets C is provided with a downwardly and inwardly-extending locking lug 20, said lugs being carried beyond the inner ends of the brackets a sufficient distance to reach the lower edge of the girder B when the inner portion of the body of the bracket rests upon the upper edge of the girder; and at the lower end of each locking lug 20 a hook-shaped terminal 21 is provided that engages with the bottom edge of the girder B as is shown in Fig. 1, thus holding the bracket in position. The other set of brackets however, are provided with very short hook-shaped locking lugs 22, as is shown in Fig. 1, adapted to simply engage with the upper edge and outer face of the girder B. In the arrangement of the brackets, the brackets having the long lugs are made to alternate with the brackets having the shorter lugs 22, as is indicated in Fig. 2. The brackets C are placed upon the girder B in pairs, the brackets of a pair being opposite each other and located at one side of a saddle A'.

To assist in maintaining the brackets C in proper position relatively to the girder B, a recess 23 is made in the under face of each bracket at its inner end to receive the inner longitudinal upper edge portion of the girder B, and when the brackets are in position on the girder their inner ends extend inwardly from the upper edges of the girder so as to direct any liquid that may be received by the brackets into the said trough or gutter-shaped girder B.

Each sash bar or rafter D rests upon the lugs 16 of its supporting bracket C, and consequently the hot air in the greenhouse can circulate all around the inner or heel ends of the said sash bars, keeping them practically dry, and the lugs 16 hold the said sash bars at their lower ends out of possible engagement with the liquid conducted by their

supporting brackets; but should any moisture collect upon the sash bars D it is conducted off through the medium of longitudinally inclined channels 24, produced in the sides of the sash bars adjacent to its bottom portion, and these channels deliver the liquid collected upon or received by the sash bars, to the forward portions of the brackets C and eventually such liquid finds its way to the gutter-shaped girder B which is practically a secondary gutter for the structure, the main or roof gutter E being above it.

Each sash bar D is provided upon its upper face with a rib 25 and a downwardly and inwardly inclined wall 26 at each side of said rib as is particularly shown in Fig. 6, forming a series of channels 27 when the window panes 28 have been placed in position relatively to the sash bars. These window panes rest upon the upper side edges of the sash bars and bear against the sides of the flanges 25 as shown in Fig. 6, and the putty 29, or other cementing material, is placed upon the said panes and is beveled up to the upper faces of the upper ribs 25 of the sash bars as also shown in Fig. 6. In the further construction of each sash bar D, the upper portion of its inner end is given a slight bevel for a purpose to be hereinafter described.

Relatively to the main or roof gutter E it is made of sheet metal and is also practically V-shaped but is of greater dimensions than the secondary gutter formed by the girder B. The bottom portion 31 of the main gutter E extends from the opposing lower ends of the angle webs of the brackets C, as is shown in Fig. 1, and the sides of the main gutter E extend upward in opposite directions in engagement with the upper edges of the body sections 18 of the angle webs C', and over the upper edges of the head sections or members 19 of the said webs to an engagement with the under faces of the panes 29, so that any moisture that may accumulate on the bottom portions of the panes will find its way downward to the under faces of the sides of the main gutter E and will be conducted to the secondary gutter or girder B.

A recess 33 is made in the rib 25 of each sash bar or rafter D at its inner end; and in each of said recesses 33 a clamp 34 is fitted, each clamp being provided with a downwardly-extending head member 35, that bears upon the upper edges of the main gutter E and holds said portions of said gutter in fast engagement with the head sections 19 of the angle webs C'. The same bolts 36 employed to hold the clamps 34 in position on the sash bars D also serve to fasten the long locking lugs 20 to the brackets C, since by preference the long lugs 20 are made independent of their brackets C, while the shorter lugs 22 are cast integral with

their brackets as clearly indicated in Fig. 1. The brackets C are attached to the sash bars D by means of screws or bolts 37 passed through them and up into the sash bars.

5 It will be observed that the heated air in the greenhouse under the construction described will have free access all around the main girder or secondary gutter B, and that said gutter will receive any product of con-
10 densation on the roof structure, while the outer gutter E will take off any water which may accumulate on the roof; and since the heated air in the greenhouse reaches the entire bottom portion of the roof, or main
15 gutter E, and said gutter is constructed of thin material, the main gutter becomes quite warm and tends to quickly free the roof from ice or snow which may be received thereon. Furthermore, it is evident that there will be
20 but little condensation on the sash bars since the hot air in the greenhouse has access to all parts thereof except their outer ribs 25. It is also evident that the construction is exceedingly simple, durable and economic and
25 well adapted for the purpose intended.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a greenhouse construction, a sup-
30 porting girder shaped to constitute an inner or secondary gutter, an outer or roof gutter supported above and independent of said secondary gutter, sash bars supported by the said girder and serving as supports for the
35 main or roof gutter, the said girder or secondary gutter being fully exposed to the heated air within the greenhouse, the said main or roof gutter being constructed of thin metal, and means for conducting the products of
40 condensation from the glass of the greenhouse and the sash bars to the said girder or secondary gutter the side walls of the gutter being arranged beneath the glass, and clamps secured to the sash bars and having heads for
45 engaging the side walls of the main gutter whereby to retain them in place.

2. In a greenhouse construction, a supporting girder, gutter shaped in cross section and adapted to constitute an inner or second-
50 ary gutter for the roof system, brackets extending from opposite sides of the girder, means for locking the brackets to the girder, sash bars the inner ends of which are supported by said brackets, panes of glass supported by the sash bars, and a main or outer
55 gutter located over the girder or secondary gutter independent of the latter and supported by said brackets, the upper edges of

the main gutter extending to an engagement with the under faces of the panes carried by 60 the bracket-supported sash bars and clamps secured to the sash bars and having heads for engaging the edges of the main gutter whereby to retain them in place.

3. In a greenhouse construction, a sup- 65 porting girder, brackets having locking engagement with the girder, which brackets extend over the said girder and are provided with side flanges and with transverse lugs separated from the flanges, an abutment formed 70 upon each bracket, and a sash bar for each bracket engaging with the abutment thereof and resting upon the lugs of the bracket.

4. In a greenhouse construction, the combination with a V-shaped supporting girder 75 and brackets having locking engagement with the girder, said brackets extending over the girder and being provided with side flanges, transverse lugs and angle webs at their inner ends, the lugs being spaced from 80 the side flanges and the said girder being adapted as an inner or secondary gutter, of sash bars the inner ends of which engage with the angle webs of the brackets the bottom of their inner portions being made to rest on 85 the lugs of the brackets, a roof gutter located above yet independent of the girder, the side portions of which roof gutter are supported by said angle webs, panes of glass fitted to the sash bars, extending over the upper edges 90 of the roof gutter, clamps for the roof gutter carried by the sash bars and acting as stops for the lowermost panes of glass, and means for conducting products of condensation from the glass and the sash bars to the said 95 girder or secondary gutter.

5. In a greenhouse construction, a gutter, a plurality of sash bars inclined toward the gutter and having their lower ends supported thereby, each of said sash bars being pro- 100 vided upon its upper face with a central longitudinal rib, said upper face being inclined downwardly and inwardly upon each side of the rib, said rib being cut away at the lower end of the sash bar, an auxiliary gutter 105 having its side resting against said lower end, and a clamp secured to the sash bar at the cut away portion, and engaging the side of said auxiliary gutter.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH HULBERT RICE.

Witnesses:

M. SANFORD RICE,
MABEL McCLANMING.