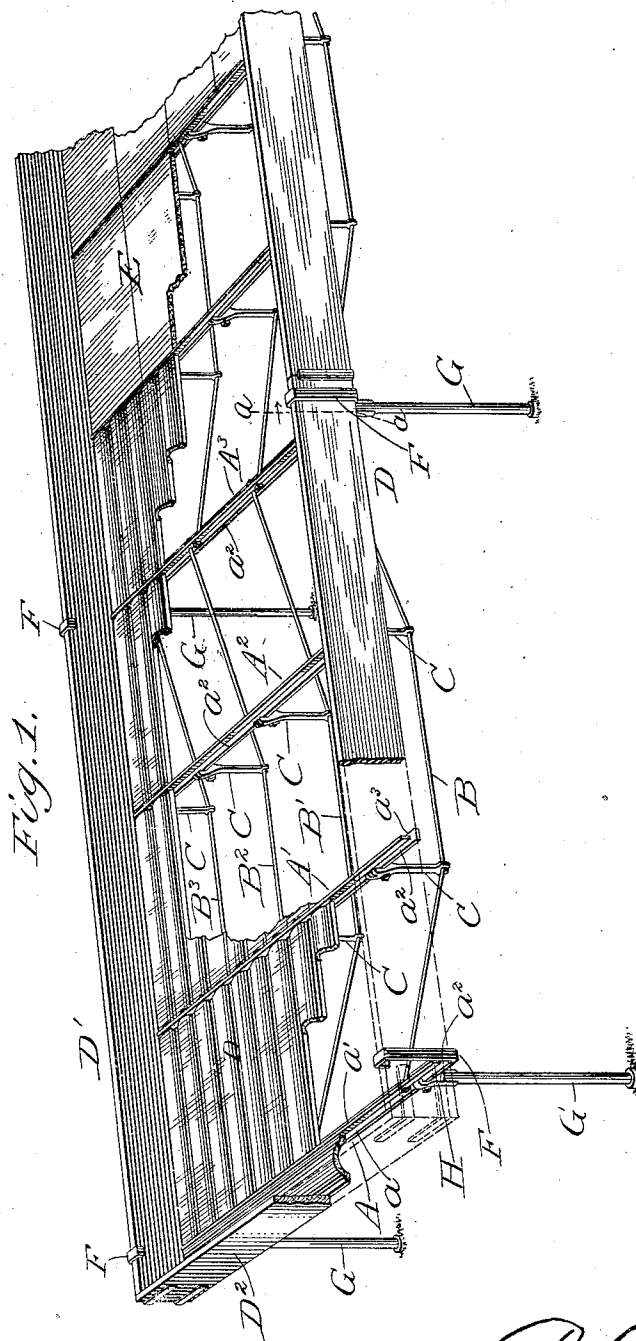


No. 858,187.

PATENTED JUNE 25, 1907.

R. O. KING.
GREENHOUSE BENCH.
APPLICATION FILED DEC. 1, 1906.

2 SHEETS—SHEET 1.



Witnesses:

W. B. Brundage.
Luther E. Morrison

By

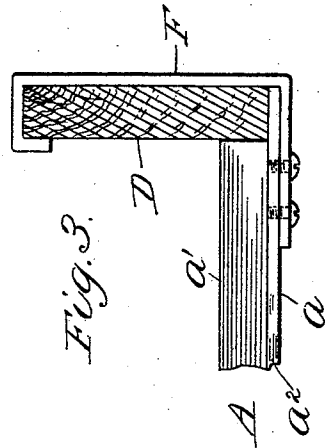
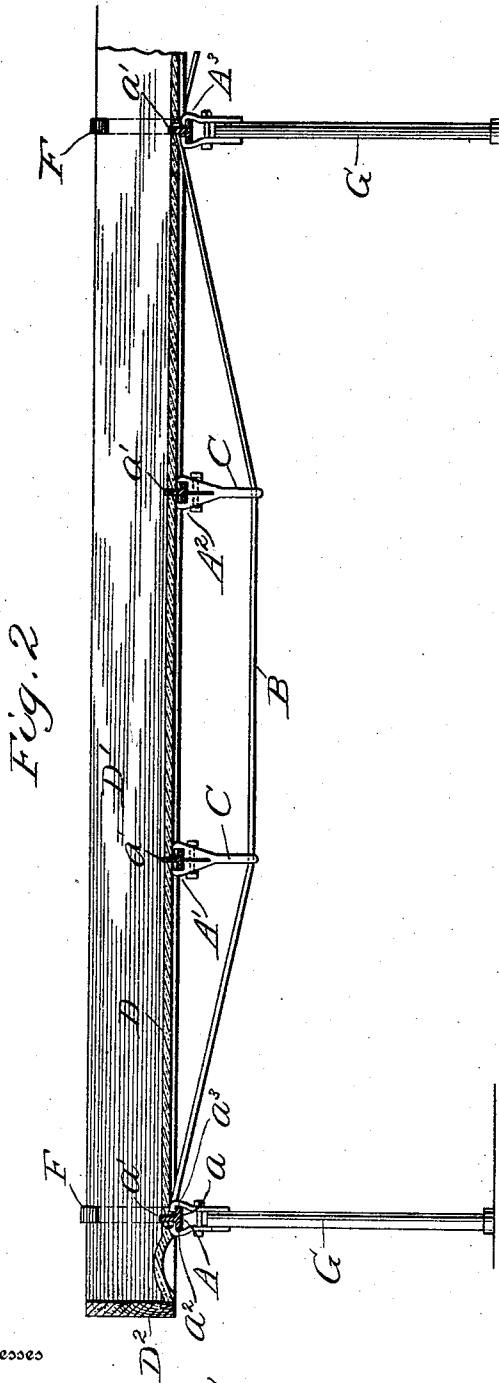
R. O. King
Attorney

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2 SHEETS—SHEET 2.



Witnesses
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UNITED STATES PATENT OFFICE.

ROBERT O. KING, OF NORTH TONAWANDA, NEW YORK.

GREENHOUSE-BENCH.

No. 858,187.

Specification of Letters Patent.

Patented June 25, 1907.

Application filed December 1, 1906. Serial No. 345,924.

To all whom it may concern:

Be it known that I, ROBERT O. KING, of North Tonawanda, in the county of Niagara and State of New York, have invented a new and useful Improvement in Greenhouse-Benches, of which the following is a specification.

This invention relates to benches designed more particularly for use in greenhouses for growing flowers and plants, where the conditions are such as to demand a strong and durable structure.

The invention consists broadly in constructing the body of the bench in the form of a trussed frame, embodying horizontal supporting cross-bars, on which the bottom of the bench, preferably in the form of tiles or slabs, is sustained in such manner that the weight of the load will through the medium of the trussed frame subject the bottom to compression edgewise, the bottom thus constituting in effect the upper or compression side of a trussed beam.

The invention consists also in the details of construction and combination of parts hereinafter described and claimed.

In the accompanying drawings:—Figure 1 is a perspective view of a greenhouse bench embodying my invention, portions being broken away to expose other parts to view, and a number of tiles forming the bottom being shown in place. Fig. 2 is a vertical longitudinal section through the same. Fig. 3 is a transverse section on the line $a-a$ of Fig. 1, showing how the side boards are held in position.

In the accompanying drawings, I have represented only so much of my improved bench as will be necessary to illustrate the principles of construction involved.

In practice, the bench may be extended as a continuous structure for whatever length desired, this extension involving merely the lengthening of the structure without changing its principles of construction. In other words, the bench may be lengthened to any extent desired by building it up progressively on the same principles involved in a single element or portion.

The frame comprises a number of horizontal transverse supporting cross-bars $A A' A^2$

and A^3 , in the present instance four in number, and each consisting of a length of commercial T-iron with a horizontal flange a and a vertical central web a' . The two outer bars $A A^3$ are preferably of heavier material than the others, and constitute the outer limits or ends of a single complete element, of a plurality of which the continuous lengthened structure is made up. These cross-bars are so disposed that the horizontal flanges will present horizontal supporting ledges a^2 and a^3 on opposite sides of the vertical web extending upward therefrom, which ledges are adapted to receive and give support to a sectional bottom, the sections of which are in the form of tiles or slabs, as will be more fully described later on. The cross-bars are spaced apart and firmly connected in fixed relations by means of a number of tension truss-rods $B B' B^2$ and B^3 , in the present instance four, extending longitudinally parallel with each other. At their opposite ends these tension rods are extended through the vertical webs of the two end cross-bars $A A^3$, and have nuts or heads applied to their ends. Between these points the tension rods extend beneath the intermediate cross-bars $A' A^2$, against which they are braced by means of vertical struts C clamped at their upper ends around the lower flanges of the cross-bars, and formed in their lower ends with sockets in which the tension rods are seated. At this point it is to be observed that the intermediate cross bars are sustained wholly by the truss rods through the intermediary struts C , whereby the weight of the load on the bench will tend to press the trusses downward between their ends and thus draw the end bars $a a'$ toward each other, as and for a purpose more fully hereinafter explained.

The bottom of the bench, as before stated, is made up of a series of sections either in the form of tiles D , such as shown to the left in Fig. 1, or slabs E , such as shown to the right in said figure, these sections D or E , which are seated at their ends on the horizontal ledges $a^2 a^3$ of the cross bars, being arranged closely side by side and in rows disposed end to end, thus completely filling the space between the bars and conjointly forming for

the bench a continuous bottom, of which the intermediate sections and the inner ends of the terminal sections are supported by the intermediate downwardly yielding cross bars. Under this construction and arrangement, the sectional bottom constitutes in effect the upper or compression side of a trussed beam, in that, owing to the bottom being sustained between its ends by the bars $A' A^2$ which in turn are supported wholly by the trusses, the weight of the mass of material on the bench tends to sag the bottom thereof at a point between its ends, thus exerting a downward pressure on the trusses at an intermediate point, whereby the trusses are tensioned and caused to draw the end bars $A A^3$ toward each other, thereby effecting an edgewise compression of the bottom sections, or in other words, opposing the resistance of the sections and the tension of the trusses one against the other. It is apparent, therefore, that under this action of the parts the structure may be made very light and at the same time possess great strength and durability; adapting it to withstand without injury or breakage the severe strains resulting from the heavy weight of the mass of soil resting on the bottom of the bench.

Rising from the bottom of the bench at the edges of the same, are side boards $D D'$ connected at their ends by end boards D^2 for the purpose of confining the soil. These boards are suitably connected together to form a rectangular structure to surround the bottom, the side boards $D D'$ resting at their lower edges on the outer extremities of the lower flanges of the cross-bars, which flanges are exposed at these points by cutting away a portion of the vertical web in order to leave a flat supporting seat. The side boards are held securely down on these seats by means of clips F fastened at their lower ends to the under sides of the two end cross-bars, and extending upward therefrom along the outer sides of the side boards and engaging over their upper edges as clearly illustrated in Fig. 3.

The side boards applied in the manner described serve to maintain the trussed frame in shape while the tiles are being set in place, and they also serve to prevent the frame from twisting in the event of its being unevenly loaded.

It will be understood that the details of my improved structure may be variously modified and changed without departing from the principles of construction as illustrated and described. For instance, a greater or less number of cross-bars may be employed, and a greater or less number of tension rods used; and other means than those shown may be employed for holding

the side boards down on their seats, the essence of the invention residing in combining with a trussed supporting frame, a bottom so disposed as to form in effect in connection with said frame, the upper or compression side of a trussed beam.

The bench may be supported above the ground in any suitable manner, but I prefer to employ legs G in the form of piping, provided at their upper ends with clips H adapted to embrace the lower flanges of the end cross-bars near their outer extremities.

Having thus described my invention, what I claim is:—

1. In a green-house bench, the combination of end cross bars, tension rods connected with and extended between said end bars, an intermediate supporting cross bar arranged above and sustained wholly by the tension rods, and a bottom mounted on and sustained by said cross bars.

2. In a green-house bench, the combination of end cross bars, tension rods extended between and connected with said cross bars, an intermediate cross bar arranged above and sustained wholly by the tension rods, and a sectional bottom mounted on and sustained by said cross bars.

3. In a green-house bench, the combination of end cross bars, tension rods extended between and connected with said cross bars, an intermediate cross bar, struts interposed between said intermediate bar and rods for supporting the latter wholly by the former, and a bottom mounted on and sustained by said cross bars.

4. In a green-house bench, the combination of end cross bars, tension rods extended between and connected with said cross bars, a plurality of intermediate cross bars arranged above and sustained wholly by the tension rods, and a bottom mounted on and sustained by the cross bars and adapted to receive an edgewise compression when the rods are tensioned under the weight of a load on the bottom.

5. In a green-house bench, the combination of end cross bars provided with horizontal supporting ledges, tension rods extended between and connected with said cross bars, an intermediate cross bar arranged above and sustained wholly by the tension rods and having horizontal supporting ledges and bottom sections arranged between the cross bars and seated on the supporting ledges.

6. In a green-house bench, the combination of a frame embodying end cross bars, tension rods extended between and connected with said end bars, an intermediate cross bar arranged above and sustained wholly by the tension rods and adapted, together with the end bars, to support a bot-

tom, and side boards mounted on and connected with the end cross bars and serving to prevent twisting of the frame.

5 7. In a green-house bench, the combination of end cross bars, tension rods extended between and connected with said cross bars, an intermediate cross bar arranged above and sustained wholly by the tension rods, said cross bars having horizontal supporting
10 ledges and vertical webs, and bottom sec-

tions arranged between the cross bars with their ends resting on the ledges and abutting against the vertical webs.

In testimony whereof I hereunto set my hand this 26th day of November, 1906, in the 15 presence of two attesting witnesses.

ROBERT O. KING.

Witnesses:

COVERT ROBERTSON.

EDW. W. MESSING.