O. T. BELCHER.

WING SPAR CONSTRUCTION FOR AEROPLANES.

APPLICATION FILED AUG. 9, 1921.

1,417,657. Patented May 30, 1922.

Fig. 1.

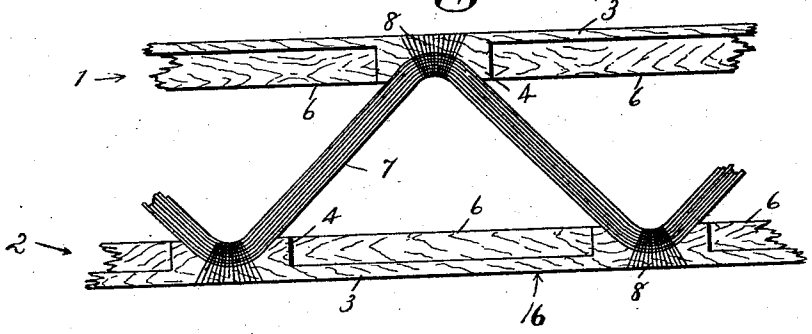


Fig. 2.

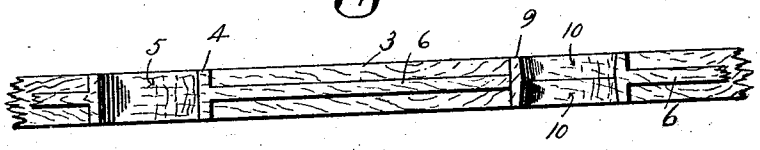


Fig. 3.

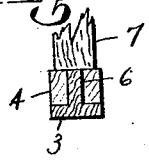


Fig. 6.

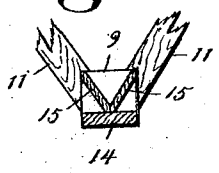


Fig. 4.

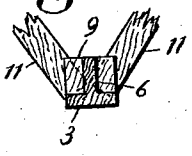


Fig. 5.

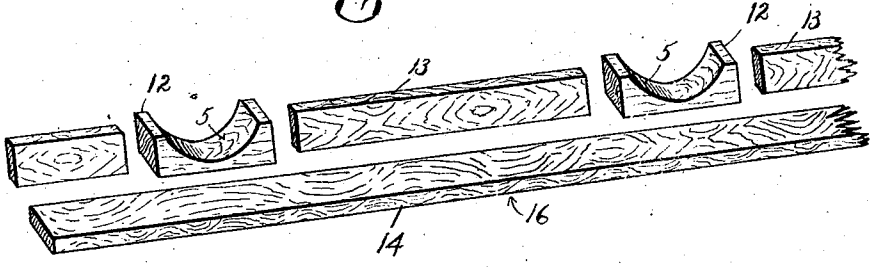
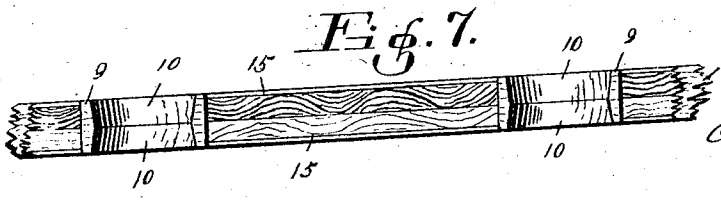


Fig. 7.



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UNITED STATES PATENT OFFICE.

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WING-SPAR CONSTRUCTION FOR AEROPLANES.

1,417,657. Specification of Letters Patent. Patented May 30, 1922.

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To all whom it may concern:

Be it known that I, OSMOND THERON BELCHER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Wing-Spar Constructions for Aeroplanes, of which the following is a specification.

My invention relates to improvements in wing spar construction for aeroplanes; the objects of the present invention being to provide a new and useful cord member for the internal bracing of wings and fuselage; to be used more particularly in the building up of cantilever wing spars; to make a wing spar cord member having rigid brace seats and a construction in which the weight of the material used is disposed to give the greatest strength and stiffness.

With reference to the drawings,—

Fig. 1 is a view in elevation of a section of a cantilever wing spar showing a novel construction of top and bottom cord members.

Fig. 2 is a top view of a cord member as shown in Fig. 1 showing a brace seat block having a single face and a second brace seat block having a double face.

Fig. 3 is an end view of a cord member having a single faced brace seat block.

Fig. 4 is an end view of a cord member showing a brace seat block having a double face.

Fig. 5 is a perspective view of the several parts composing a cord member where such members are built up rather than being cut out from solid pieces as shown in the first four figures.

Fig. 6 shows an end elevation of a cord member and brace seat block having two faces.

Fig. 7 is a top view of a cord member having brace seat blocks constructed with two faces.

In the present invention in order to obtain from the material used for the cord members 1 and 2 the greatest resistance to compression and tension stresses, the cord members are made T-shaped as shown in Figs. 1 to 5 inclusive, for such cord members as are adapted to be supported by a single brace as shown in Fig. 1, there being a plate 3 upon which are fixed brace seat blocks 4 having a face 5 and between the brace seat blocks 4 are ribs 6.

Two such cord members are intended to be supported by a continuous laminated wood brace 7, the brace being glued into the seats and bound with heavy thread 8.

Such a cord member may also carry brace seats 9 having two faces 10, 10 as shown in Fig. 2, and be adapted to seat anglingly two braces 11, 11 as shown in Fig. 4.

The cord members may be milled out of solid sticks of wood with the brace seats 4 or 9 and the ribs 6 integral with the plate 3, or as shown in Fig. 5 brace seats 12, ribs 13 and plates 14 may be made separately and glued together into a strongly constructed built up cord member.

In the use of double faced brace seats and with two braces mounted anglingly in the seats the rib 6 may be divided into two ribs 15, 15 as shown in Figs. 6 and 7, the two ribs being set in line with the two angling braces. Such a construction of the cord member may also be milled from solid sticks or made up of individual members as shown for the single ribbed cord members in Fig. 5.

Such a construction of cord members while providing the greatest possible rigidity from the weight of material used also presents a very wide surface 16 against which the covering of the wings may bear.

It is obvious that various changes might be made in the invention as shown without departing from the spirit thereof as claimed.

Having thus described my invention, I claim:

1. In a wing spar construction for aeroplanes, a cord member comprising a plate, brace seat blocks formed upon the plate and ribs made integral with the plate and the brace seat blocks and extending up between the blocks.

2. In a wing spar construction for aeroplanes, a cord member comprising a plate, brace seat blocks glued at intervals upon the plate and ribs glued upon the plate and extending up between the brace seat blocks and having their ends glued to said blocks.

3. In a wing spar construction for aeroplanes, a cord member comprising a plate, brace seat blocks mounted upon said plate and having two opposed brace seat faces facing outwardly and ribs positioned upon

the plate and extending between the blocks, there being one rib in alignment with each of said angling brace seat faces.

4. In a wing spar construction for aeroplanes, a pair of spaced cord members, each of which being composed of a plate, brace seat blocks mounted upon the plate and ribs positioned upon the plate and extending up between the blocks, and a continuous laminated zigzag wood brace element extending between the two spaced cord members and having the angular bends thereof positively seated in the said brace seat blocks.

OSMOND THERON BELCHER.