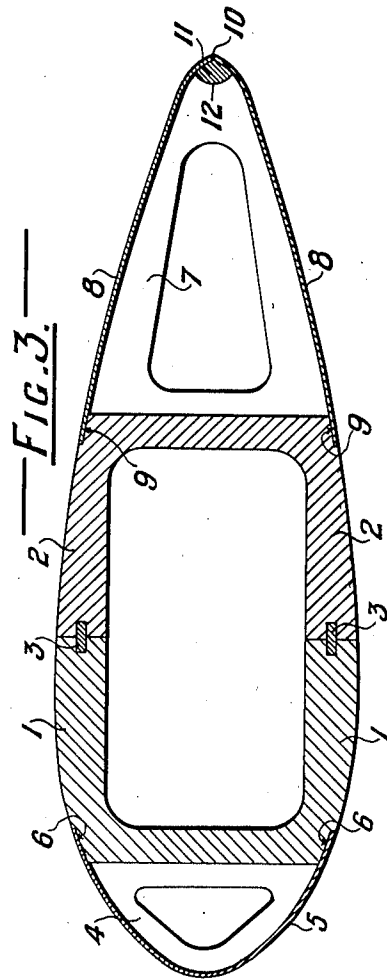
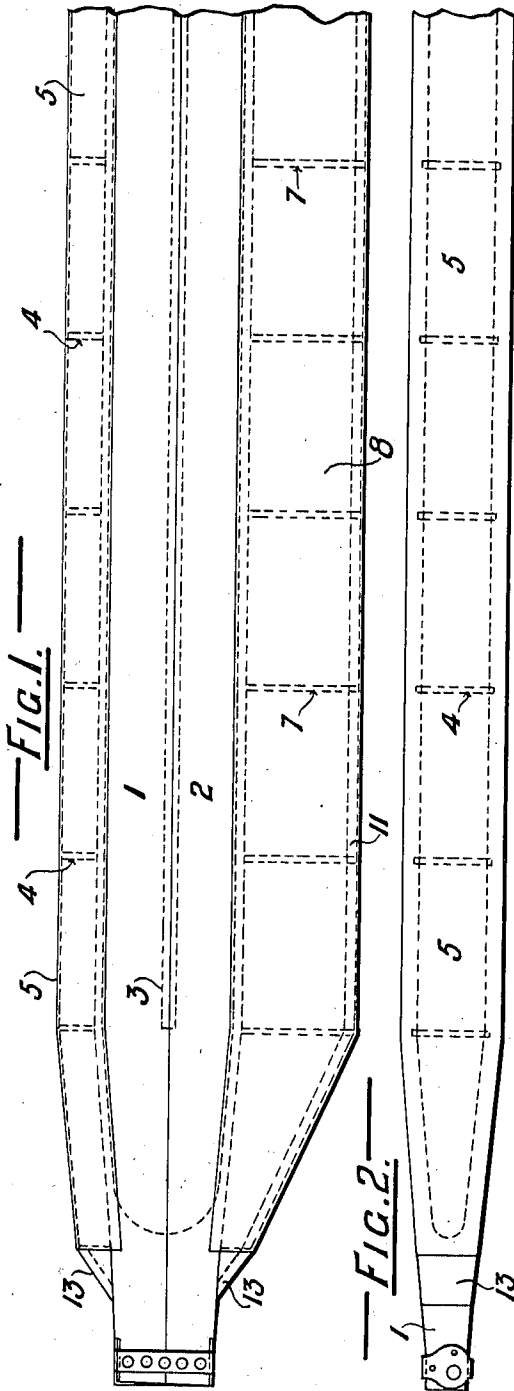


F. H. PAGE.
 STREAM LINE HOLLOW SPAR OR STRUT FOR AIRCRAFT.
 APPLICATION FILED MAY 26, 1919.

1,317,032.

Patented Sept. 23, 1919.



Frederick Handley Page,
 Inventor.
 By *Wm. E. Lamb, Atty.*

UNITED STATES PATENT OFFICE.

FREDERICK HANDLEY PAGE, OF LONDON, ENGLAND, ASSIGNOR TO HANDLEY PAGE LIMITED, OF LONDON, ENGLAND.

STREAM-LINE HOLLOW SPAR OR STRUT FOR AIRCRAFT.

1,317,032.

Specification of Letters Patent.

Patented Sept. 23, 1919.

Application filed May 26, 1919. Serial No. 300,002.

To all whom it may concern:

Be it known that I, FREDERICK HANDLEY PAGE, a subject of the King of Great Britain, residing at London, England, have invented certain new and useful Improvements in Stream-Line Hollow Spars or Struts for Aircraft, of which the following is a specification.

Hollow spars have before been constructed of separate lengths of wood hollowed out and joined longitudinally and these have been made in various forms and cross sections. In all cases however the material forming the spar has been shaped to accommodate not only the external form required but to satisfy the resistance to strains and shock to which the spar is to be subjected.

According to this invention the spar is first constructed in a form most suitable for the strains which it is to receive and the spar thus constructed is then fitted with external fairings at the leading and trailing portions of the spar, the fairings being made as light as possible in view of the fact that they are required to resist wind force only and are not required to take any of the strain.

In the accompanying sheet of drawings a strut suitable for connection between the upper and lower wings of an aeroplane is illustrated, Figure 1 being an external side view of one end of such a strut and Fig. 2 a front view of the same. Fig. 3 is a cross section drawn to a larger scale than the previous figures.

The material forming the strain bearing portion of the strut is shown in two pieces 1 and 2 joined together longitudinally, the two opposite faces of the parts 1 and 2 being suitably grooved to receive a feather 3 by which they are firmly keyed together. Similar joints are made on all abutting faces of the strut sections and when these joints have been effectively made, a hollow strut is produced of approximately rectangular form and which although extremely strong would offer considerable resistance when forced through the air in flight.

The exterior is therefore shaped to enable fairings to be attached, which, when joined to the hollow strut itself will form a good streamline and these fairings on the leading edge and on the trailing edge are best produced by attaching, in the case of the leading fairing, outstanding formers 4 around which the thin material 5 forming the exte-

rior of the fairing can be bent and by the formers 4 be caused to assume the shape required. As shown in Fig. 3 the formers 4 may be of skeleton form.

The thin material 5 at the edges where it joins to the strut section 1 is received in recesses 6 so as to make its external form continuous with the strain bearing portion of the strut. This thin material 5 is preferably formed of single ply wood, the grain running longitudinally of the strut and it has been found that this material assumes the required form more perfectly than other materials.

The trailing fairing is constructed in a somewhat similar way on formers 7, the thin material 8 being received in recesses 9 in the after section 2 of the strain bearing portion of the strut. In this case however owing to the more acute angle of the trailing edge of the fairing, the thin material 8 is applied in two portions joined together at the extreme trailing edge 10 where it is supported on the interior by a longitudinal strip 11 held in recesses 12 situated in the formers 7.

The struts constructed in accordance with this invention are only provided with fairings through the greater portions of their lengths, the said fairings being reduced and tapered down to meet the strain bearing portion of the strut so as to leave the ends of the strain bearing portion projecting, to facilitate fitting to the wings or other parts of the machine.

Taper blocks 13 are attached on the forward and trailing edges of the solid projecting portions of the strut, where the fairing commences in order to form a seat for the reception of the thin material and to make a good joint and a firm connection with the strain bearing portion of the strut.

What I claim as my invention and desire to secure by Letters Patent is:—

1. A hollow spar built up of strain bearing portions designed for receiving strain only, combined with wind fairing portions comprising transverse skeleton formers supporting and shaping thin sheathing designed for reducing the wind resistance only.

2. A hollow spar or strut comprising a built up strain bearing member having solid ends in combination with a wind fairing casing at the leading edge and a wind fairing casing at the trailing edge, said wind

- fairing casings comprising a plurality of formers and a sheathing, each secured to the strain bearing member for the majority of its length and tapering at each end in order to leave the solid ends of the strain bearing member exposed.
3. A hollow spar or strut comprising a built up strain bearing member, in combination with a series of formers secured to the leading and trailing edges of the said strain bearing member and projecting at right angles therefrom and coverings or fairings around said formers secured to the sides of the strain bearing member, the whole forming a strut of streamline form.
4. A hollow spar or strut comprising a built up strain bearing member, in combination with a series of formers secured to the leading and trailing edges of the strain bearing member and projecting at right angles therefrom, a covering of single ply wood, with the grain longitudinal of the spar or strut, bent around said formers on the leading edge of the strain bearing member and secured at its edges to the sides of the said member and a cover of thin material around said formers on the trailing edge the whole forming a strut of streamline form.
5. A hollow spar or strut comprising a built up strain bearing member, in combination with a series of formers secured to the leading and trailing edges of the strain bearing member and projecting at right angles therefrom, a covering of single ply wood, with the grain longitudinal of the spar or strut, bent around the formers on the leading edge of the strain bearing member and secured at its edges to the sides of the said member, a longitudinal strip supported by the formers on the trailing edge of the strain bearing member and two coverings attached to one side of said longitudinal strip and to the sides of the strain bearing member, the whole forming a strut of streamline form.
6. In an aircraft spar, the combination of a strain bearing member, a skeleton frame having lateral formers, attached thereto, and a thin sheathing covering said frame to produce a streamline form.
- In witness whereof I have hereunto set my hand in the presence of two witnesses.
- FREDERICK HANDLEY PAGE.
- Witnesses:
GRIFFITH BREWER,
CYRIL GRIFFITH BREWER.