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AIRPLANE WING STRUCTURE

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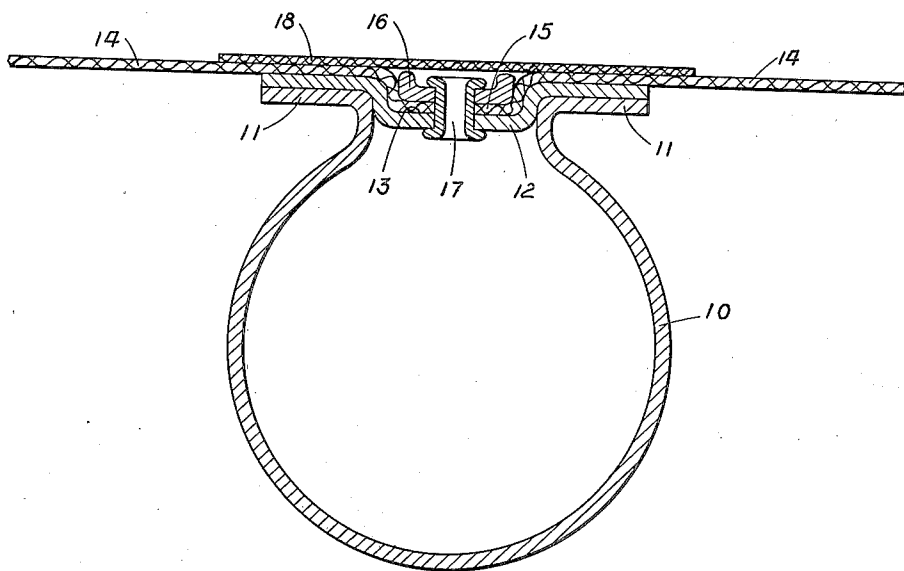


Fig. 1

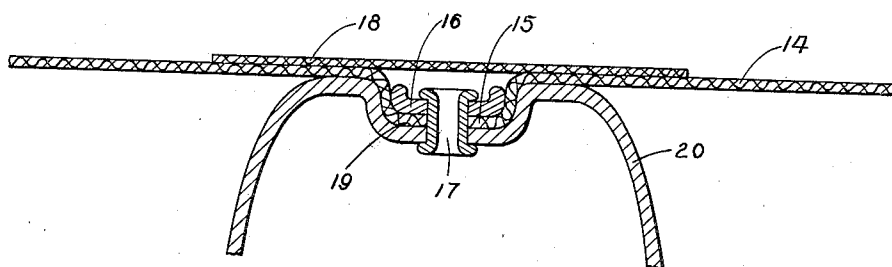


Fig. 2

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AIRPLANE WING STRUCTURE

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1 Claim. (Cl. 244—132)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This invention relates to an airplane wing structure and it has a particular relation to means for securing the fabric to the frame or rib elements thereof.

5 The principal object of the invention is the provision of means for attaching the fabric to the ribs of an airplane wing so as to present a substantially flush surface to the airflow.

10 Another object of the invention is the provision of means whereby the fabric may quickly and easily be secured to and removed from the frame structure of the wing without in any way sacrificing the supporting characteristics of the wing, and which will effectively resist any tendency to rip or tear at this point due to the friction of the airflow.

15 With these and other objects in view, as well as other advantages that may be incident to the use of the improvements, the invention consists in the parts and combinations thereof hereinafter set forth and claimed, and with the understanding that the several necessary elements constituting the same may be varied in proportion and arrangement without departing from the nature and scope of the invention, as defined in the appended claim.

20 In order to make the invention more clearly understood, there are shown in the accompanying drawing, means for carrying the invention into practical use, without limiting the improvements in their useful application to the particular construction, which, for the purpose of explanation, have been made the subject of illustration.

In the accompanying drawing:

25 Fig. 1 is an enlarged transverse sectional view through an airplane wing rib and illustrating the improved means for securing the fabric thereto; and

30 Fig. 2 is a similar view of another form of rib construction.

35 Referring to the drawing, and particularly to Fig. 1 thereof, an airplane wing structure embodying the invention is shown as comprising a hollow rib member 10 of modified U-shape in cross section and formed at its outer edge with outwardly extending flanges 11. Secured to these flanges by welding, riveting, or in any preferred manner, is a member 12 having a central depression 13 which closes and seats within the space along the outer side of the rib 10.

40 Extending over the outer surface of the rib 10 and member 12 is the main supporting fabric 14 of the wing which is flexed inwardly into the depression 13, as indicated at 15, and secured therein by a channel member or retaining strip 16. This member securely clamps the fabric in position and is secured within the depression 13 by fastening means in the form of tubular rivets 17. The retaining strip 15 and fastening means 16 are disposed wholly within the outer fabric sup-

porting surface of the rib and are enclosed by a strip of tape 18 which bridges these members and is secured to the fabric 18 along its edges by a suitable adhesive so as to present a substantially flush unbroken surface to the airflow of the wing. 5

In Fig. 2 a slightly modified rib construction is illustrated wherein a depression 19 is formed directly in the outer edge of a tubular rib 20, and in which the fabric is secured in a manner similar to that previously described. It will be noted, 10 however, that in both of these constructions the parts which secure the fabric to the rib are disposed entirely within the plane of the airflow and present little or no resistance thereto.

A construction such as that described enables 15 the fabric to be quickly and easily attached to or removed from the supporting structure with the simplest of tools and from the outside surface of the wing. Moreover, the fabric is held in position in a continuous line rather than at intervals, which materially reduces the tendency for the fabric to rip or tear at its line of attachment, which tendency has heretofore been principally due to the relative looseness of the fabric between the attaching rivets. 20

25 Other modifications and changes in the proportions and arrangement of the parts may be made by those skilled in the art without departing from the nature and scope of the invention as defined in the appended claim. 30

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor. 35

I claim:

Airplane wing structure comprising a rib having an inner portion of substantially U-shape in cross-section formed with outwardly extending spaced flanges on the legs thereof and an outer portion having a longitudinally extending depression disposed within the space between the legs of the U-shaped portion and having oppositely extending fabric supporting flanges overlying and secured to the flanges of said U-shaped portion; fabric supported by said rib and flexed into the depression of the outer portion thereof; a channel member disposed within the depression of said outer portion for maintaining said fabric from displacement from said rib; headed rivets for securing said channel member in said depression, said channel member and the heads of said rivets being disposed wholly within the outer fabric supporting surfaces of the flanges of the outer portion of said rib; and a strip of tape secured to the outer surface of said fabric and extending over said channel member and rivets and forming a substantially flush outer surface for said wing. 55

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