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1,501,606

H. LEITNER

METAL AIR PROPELLER AND THE LIKE

Filed Jan. 21, 1922

Fig. 1.

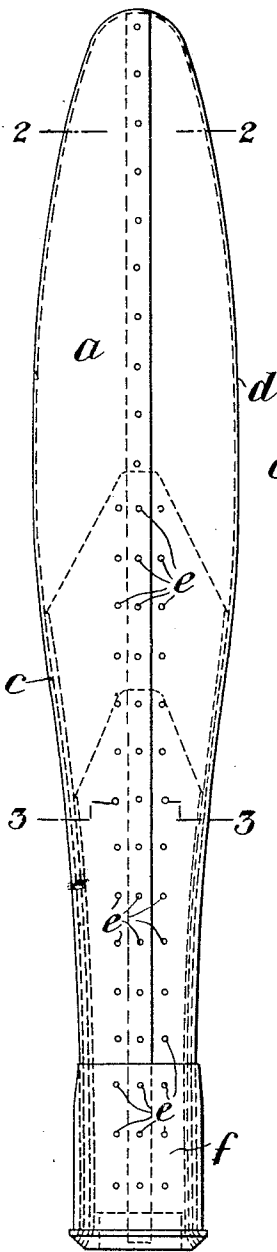


Fig. 2.

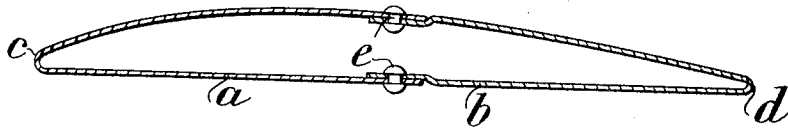


Fig. 3.

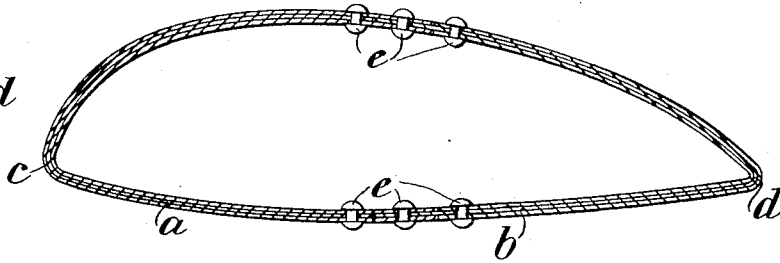


Fig. 4.

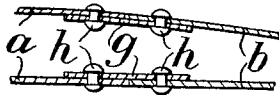


Fig. 5.

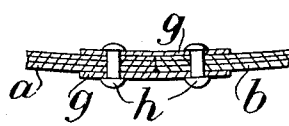


Fig. 6.

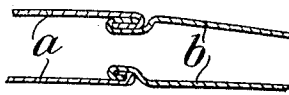


Fig. 7.

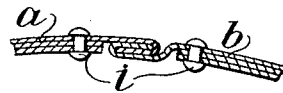


Fig. 8.



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UNITED STATES PATENT OFFICE.

HENRY LEITNER, OF LONDON, ENGLAND.

METAL AIR PROPELLER AND THE LIKE.

Application filed January 21, 1922. Serial No. 530,845.

To all whom it may concern:

Be it known that I, HENRY LEITNER, a subject of the King of Great Britain, residing at Regent House, Kingsway, London, England, have invented new and useful Improvements in Metal Air Propellers and the like, of which the following is a specification.

My invention has reference to screw-propellers, mainly for use on aircraft, of the kind in which the blades are hollow and made of sheet metal, and which are advantageously detachable from the propeller hub and adjustable therein for variations of pitch and consequently vary from an aerofoil cross section in the body to a circular cross section at the root.

In carrying out the invention, the blade is made from two sections of sheet metal folded to form the edges of the blade, the said two sections being joined by a mechanical longitudinal seam extending along each side of the blade intermediate of the two folded edges.

In a suitable arrangement for carrying out the invention, where the blade is made in two parts, I press or shape each blade so that part of the face and back thereof form one part of the blade longitudinally with the edge of the blade formed by the bend of the metal between the face and back, including the laminations. This part may be, for example, that of the leading edge of the blade, the other part being that of the trailing edge. The two portions having the bent edges and which will have the appearance of long curved troughs are then joined along the central or joint line either by lapping the edges of the sheets and riveting, or by a riveted metal strip which may be pressed up from the inside between the longitudinal dividing line, thus adding to the stiffness and forming a sort of spar. Or what is known as a tinsmith's joint may be used, that is to say, a strip of metal is bent at the edges completely round its own thickness and engages with a similarly bent edge on the adjacent edges of the blades and then both are pressed together and the central portion of the strip is pressed into the dividing line between the said two connected parts of the blades thus also forming a spar and stiffening; the clamped and compressed edges may be further riveted, if desired, or blunt punch marks made therein to further lock the

joint; the foregoing methods of fixation are mentioned by way of example only as any other known method to secure the two part blades together may be employed.

As an alternative construction the blade instead of being in two parts may consist of one part only, the back or face being shaped so that the edges of the blade are bent and prolonged to form either the back or the face longitudinally, as the case may be, the two meeting edges being joined together as described above.

To enable the invention to be fully understood, I will describe it by reference to the accompanying drawing, in which:—

Figure 1 is an elevation of a hollow sheet metal propeller blade of the type having a cylindrical stem or root designed to turn in a bearing in the propeller hub for varying the pitch, the said blade being constructed in accordance with the invention.

Figures 2 and 3 are, respectively, sections on the lines 2—2, and 3—3, Figure 1, but drawn to a larger scale.

Figs. 4 and 5 are sections illustrating modifications of the joints in the back and front of the blade illustrated in Figures 2 and 3 respectively.

Figs. 6 and 7 are similar views to Figures 4 and 5, illustrating further modifications.

Fig. 8 is a modification of the joint shown in Figure 7.

Referring to Figures 1 to 3, *a*, *b* are the two parts of the propeller blade and *c*, *d* are the respective bends therein constituting the leading and trailing edges of the blade, each of the said two parts having a somewhat troughlike form with their meeting edges overlapping at about the centre of the blade and being secured by rivets *e*, or they may be secured by other means. Figure 2 is a section through the top of the blade where only one lamina is employed, whilst Figure 3 is a section nearer the root of the blade where, say, two additional laminae are used, the overlapping joint being arranged as indicated, whereas, where all the laminae enter the cylindrical casing *f* forming the stem, the rivets *e* may also pass through the said casing.

Instead of the overlapping joints described with reference to Figures 1 to 3 the edges of the parts *a* and *b* may butt together as indicated in Figures 4 and 5, the joints being covered by metal strips *g* secured to

the said parts *a* and *b* by rivets *h*. Or other means than rivets may be employed.

Figures 6, 7 and 8 show different forms of folded or tin-smiths' joints for uniting the edges of the parts *a* and *b*, that illustrated in Figure 6 showing the edges of the said parts folded together, the inner laminæ in Figure 7 being riveted to the said jointed outer lamina by rivets *i*. Figure 8 shows a metal strip *j* intermediate of the adjacent edges of the parts *a* and *b* and having the

edges connected thereto by folded or tin-smiths' joints.

Claim:

A screw propeller of the kind described, formed from two sections of sheet metal folded to form the edges of the blade, the said two sections being joined by a longitudinal mechanical seam extending along each side of the blade.

HENRY LEITNER.