

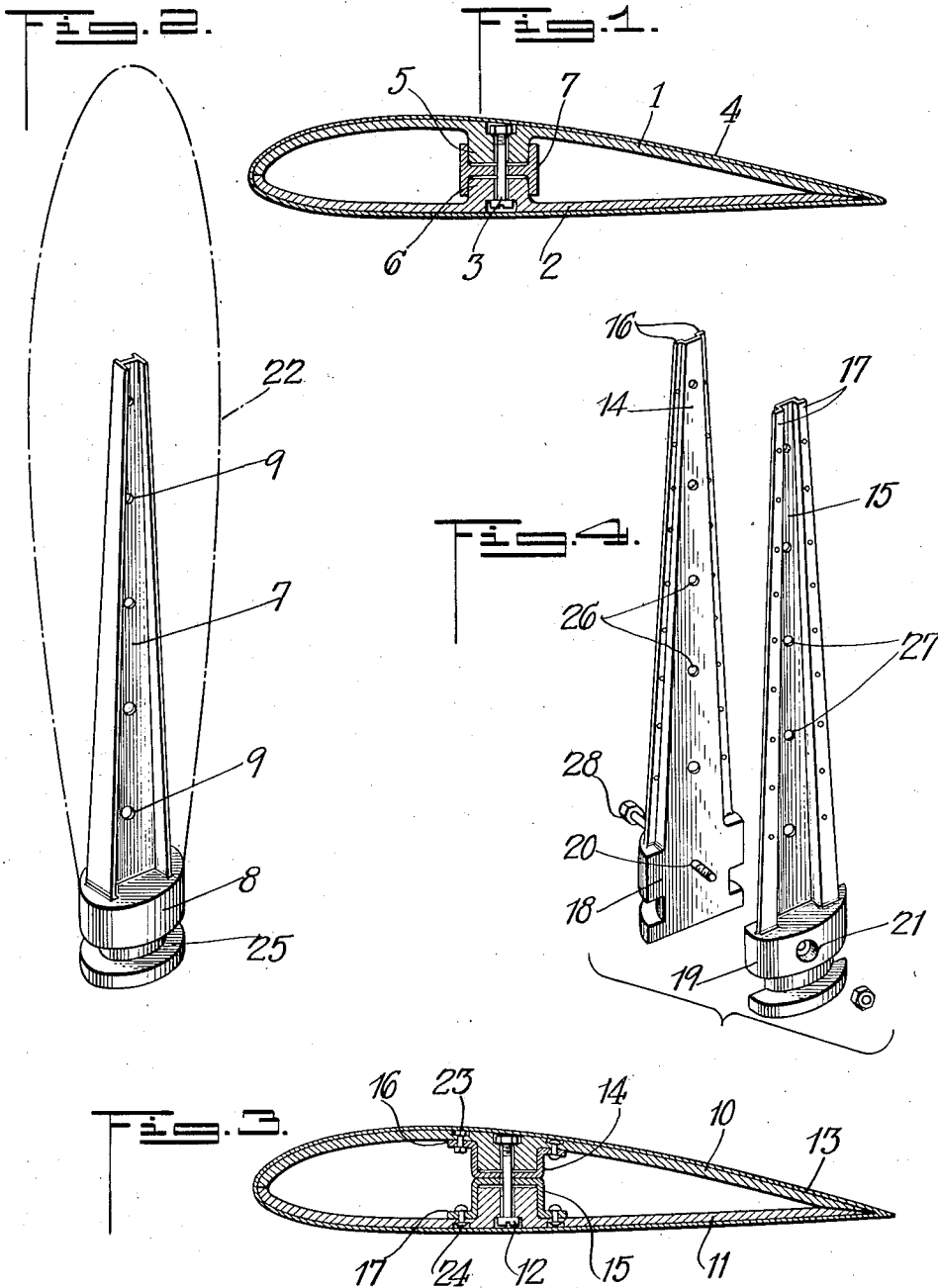
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PROPELLER BLADE

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PROPELLER BLADE

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The present invention relates to propellers, particularly for aircraft and more specifically to propeller blades which are made up of a plurality of parts which parts may be made of different materials.

The present invention is particularly useful in connection with variable pitch propellers the blades of which are made of wood.

It is an object of the present invention to provide a propeller blade which is formed by two hollow shells which are held together by screws or other suitable connecting means and the surface of which may be veneered. The blade according to the present invention comprises a metal shaft from which a tongue extends into the blade for about one third to two thirds of its length. Tongue and shaft may be longitudinally split into two parts which are held together by suitable connecting means.

Further and other objects of the present invention will be hereinafter set forth in the accompanying specification and shown in the drawing which, by way of illustration, show what I now consider to be a preferred embodiment of my invention.

In the drawing:

Figure 1 is a cross sectional view of a propeller blade according to the present invention.

Figure 2 is an isometric illustration of the core or tongue member according to the present invention.

Figure 3 is a cross sectional view of a modified propeller blade construction according to the present invention.

Figure 4 is an isometric illustration of the split tongue which is used in connection with the construction shown in Figure 3.

Like parts are designated by like numerals in all figures of the drawing.

Referring more particularly to Fig. 1 of the drawing, numerals 1 and 2 designate the hollow shells which in conventional manner, form the propeller blade proper and may be made of wood, Bakelite or a similar light material. The shells are made of wood and are covered by means of a veneer 4. The interiors of the shells 1 and 2 are provided with reinforcements 5 and 6 respectively through which bolts 3 extend which hold the shells 1 and 2 together. The reinforcements may be in the form of longitudinal projections or in the form of a plurality of individual, boss-like projections. In the interior of the hollow blade a tongue like member 7 which is preferably made of metal is provided.

The body which comprises the tongue mem-

ber 7 is illustrated in Fig. 2. It consists of shaft 8 which is rotund, forged, pressed or cast and which is provided with a reset 25 for mounting the shaft 8 to the hub of the propeller. To the shaft 8 the tongue member 7 is rigidly connected and is preferably made in one piece together with the shaft or root 8. The root part 8 may be cylindrical and provided with an annular groove 25 for rigid connection with the propeller hub and providing for adjustment of the propeller pitch. Tongue 7 has a cross sectional configuration resembling the letter H; the cross section of the tongue diminishes towards the end, i. e. towards the point of the propeller blade. Tongue 7 is provided with a plurality of bores 9 for accommodating bolts 3. The tongue is therefore connected with a large part of the shells forming the propeller blade the contour of which is indicated by means of the dotted line 22 and the centrifugal forces set up in the blade shells act on a comparatively large area and not on the root of the blade body only as is the case with conventional propeller blades. Due to the peculiar configuration of the tongue or stem 7 the propeller blade can have a very slender configuration from the root to the point and the outer end of the blade can be made very slim as is desired for aerodynamical reasons. If the cross section of tongue 7 would not diminish towards the outer end such favorable formation of the propeller blade would not be possible. It must be noted that the tongue 7 does not extend into the extreme end of the blade at all.

In the modification of a blade construction according to the present invention and shown in Figs. 3 and 4 tongue and shaft are made of two parts. The propeller blade proper consists of two hollow shells 10 and 11 which are held together by means of a plurality of bolts 12 and which are covered by the veneer 13. The tongue which corresponds to tongue 7 in Figs. 1 and 2 is made of two halves 14 and 15. These halves have substantially U-shaped cross sectional configuration and are bordered at their outer edges 16 and 17 respectively and/or are provided with reinforcing strips to which the shells or blade halves 10 and 11 are connected by means of screws 23 or rivets 24 or the like.

Figure 4 is an isometric illustration of the tongue which is made up of halves 14 and 15. The tongue or stem halves are provided with edge strips 16 and 17 respectively which are provided with bores for accommodating bolts, screws, rivets or the like for connecting the propeller shells 10 and 11. Each of the tongue

halves 14 and 15 is made of one piece with the root or shaft parts 18 and 19 which together form the rotund shaft. Each shaft half is provided with a bore or opening 20 and 21 respectively through which a connecting bolt 28 may be extended. Bores 20 and 21 are widened out at their outer parts for accommodating the head and nut of the connecting bolt so that the rotund outer configuration is not interrupted by projecting parts of the bolt. The tongue halves 14 and 15 are supplementarily pressed together by the bolts 12 which extend through the bores 26 and 27.

The embodiment of the present invention shown in Figures 3 and 4 has the advantage over the embodiment illustrated in Figs. 1 and 2 that the tongue is more rigidly connected with the blade shells. It is possible to first individually connect tongue half 14 with shell 10 and tongue half 15 with the shell 11 by means of screws, bolts, rivets or the like. Thereafter the two halves of the propeller blade can be connected by means of bolts 12 and the shaft or root halves 18 and 19 by means of bolt 28 extending through the bores 20 and 21.

While I believe the above described embodiments of my invention to be preferred embodiments, I wish it to be understood that I do not desire to be limited to the exact details of design and construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:

1. A propeller blade comprising a blade proper split by a cut extending substantially along the trailing edge and the leading edge into two parts, a stem member having a root portion and a tapered tongue portion of H-shaped cross sectional configuration and having a web portion and extending from said root portion and into the interior of said blade proper and being so positioned that said web portion is substantially parallel to the blade surfaces, and connecting means extending through said parts and through said web portion and rigidly connecting said parts with said tongue portion and with one another, said root portion projecting from said blade proper and being so constructed as to form the root of said blade.

2. A longitudinally split propeller blade comprising a blade proper split substantially longitudinally into two blade parts by a cut extending substantially along the edges of the blade,

a stem member having a root portion and a tongue portion extending from said root portion and into the interior of said blade proper, said root portion projecting from said blade proper and being so constructed as to form the root of said blade, said stem member being longitudinally split into two symmetric parts, said blade parts being individually rigidly connected with the tongue portions of said stem parts, and connecting means extending through the tongue portions of said stem parts and through said blade parts and being accessible from the outside of said blade parts and rigidly interconnecting said blade parts and said stem parts.

3. A longitudinally split propeller blade comprising a blade proper split substantially longitudinally into two blade parts by a cut extending substantially along the edges of the blade, a stem member having a root portion and a tongue portion extending from said root portion and into the interior of said blade proper, said root portion projecting from said blade proper and being so constructed as to form the root of said blade, said stem member being longitudinally split into two symmetric parts, said blade parts being individually rigidly connected with the tongue portions of said stem parts, connecting means extending through the tongue portions of said stem parts and through said blade parts and being accessible from the outside of said blade parts and rigidly interconnecting said blade parts and the tongue portions of said stem parts, and another connecting means extending through and rigidly interconnecting the root portions of said stem parts.

4. A propeller blade having a surface forming hollow part substantially longitudinally split to form two half shell portions, a stem member having a tongue portion of H-shaped cross sectional configuration and including a web portion and a channel on either side thereof, said tongue portion extending into said hollow part and between said half shell portions with the web portion positioned substantially parallel to the blade surfaces, longitudinal bulges projecting inward from said half shell portions and fitting tightly into the channels of said tongue portion, fastening means extending through said bulges and through said web portion and rigidly fastening said half shell portions to said stem member and to one another.

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