Feb. 3, 1931. C. R. SCHULTZ 1,790,844

AEROPLANE PROPELLER

Filed March 21, 1930 3 Sheets-Sheet 1

Fig. 1.

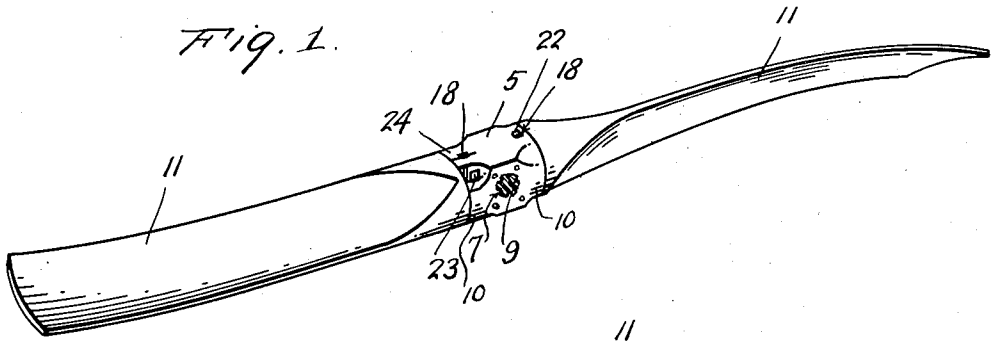


Fig. 2.

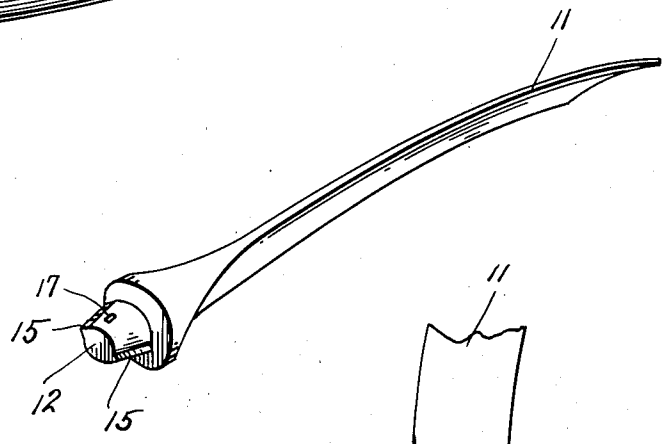
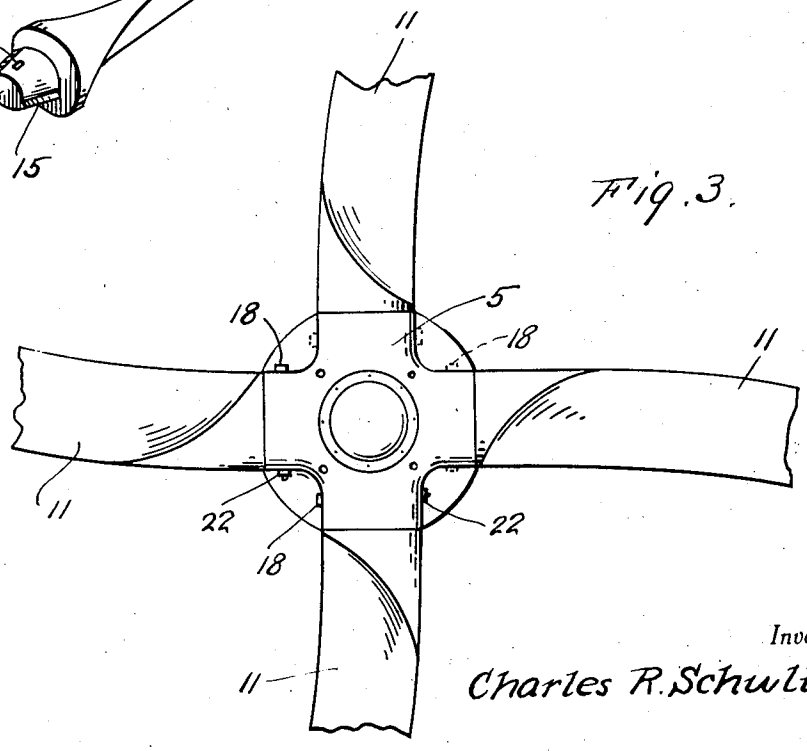


Fig. 3.



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AEROPLANE PROPELLER

Filed March 21, 1930 3 Sheets-Sheet 2

Fig. 4.

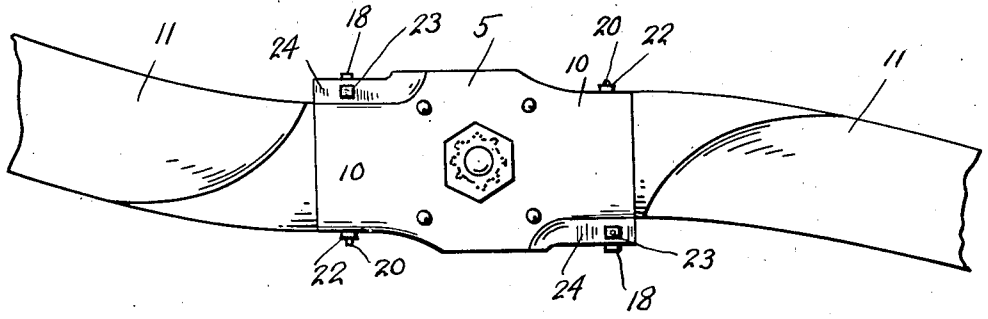


Fig. 5.

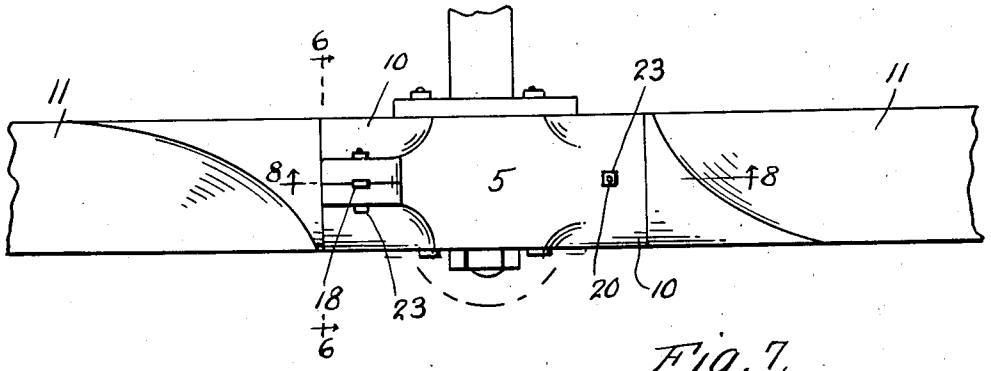


Fig. 6.

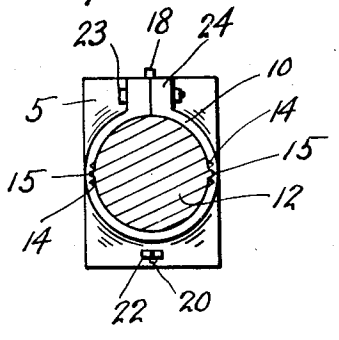
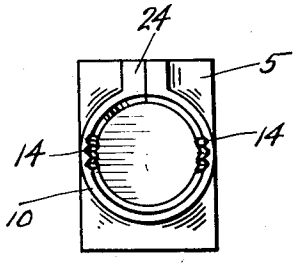


Fig. 7.



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AEROPLANE PROPELLER

Filed March 21, 1930 3 Sheets-Sheet 3

Fig. 8.

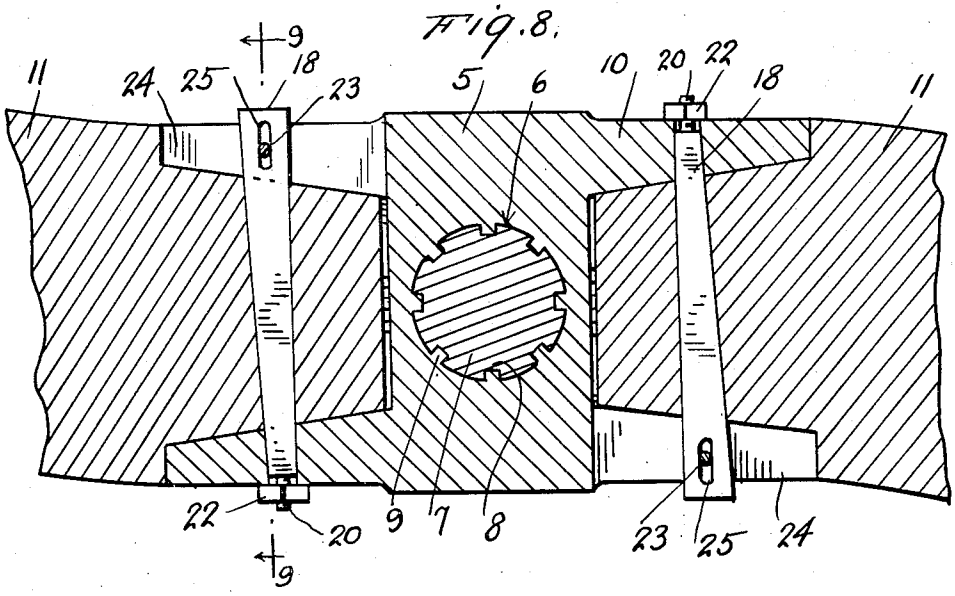
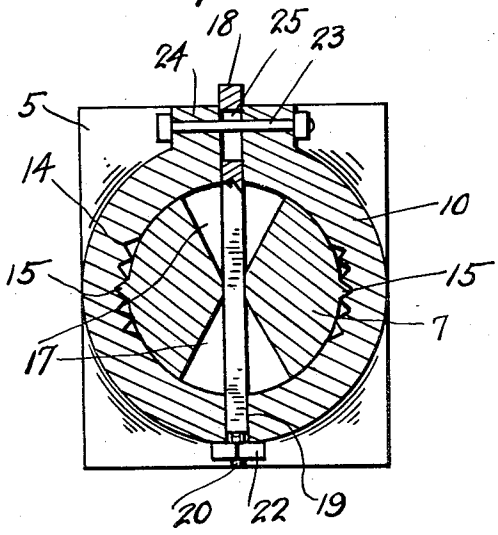


Fig. 9.



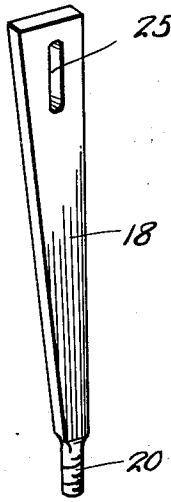
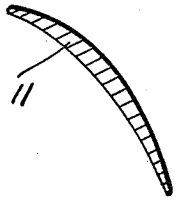


Fig. 10

Fig. 11.



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UNITED STATES PATENT OFFICE

CHARLES R. SCHULTZ, OF MENAHGA, MINNESOTA, ASSIGNOR OF ONE-HALF TO OLIVER L. BACK

AEROPLANE PROPELLER

Application filed March 21, 1930. Serial No. 437,740.

The present invention relates to propellers and particularly to those such as are used on aeroplanes and the prime object of the invention resides in the provision of a propeller including blades, the pitch of which may be varied to suit different conditions.

Another very important object of the invention resides in the provision of a variable pitch propeller of this nature which is simple in construction, strong and durable, easy to adjust, and thoroughly efficient and reliable in use.

With the above and numerous other objects in view as will appear as the description proceeds, the invention resides in certain novel features of construction, and in the combination and arrangement of parts hereinafter more fully described.

In the drawings:

Figure 1 is a perspective view of a propeller embodying the features of my invention,

Figure 2 is a perspective view of one of the blades,

Figure 3 is a fragmentary view showing another embodiment of the propeller,

Figure 4 is a front elevation of the propeller,

Figure 5 is an edge view thereof,

Figure 6 is a sectional view taken substantially on the line 6—6 of Figure 5,

Figure 7 is a detail view of one end of the hub,

Figure 8 is a sectional view taken substantially on the line 8—8 of Figure 5,

Figure 9 is a sectional view taken substantially on the line 9—9 of Figure 8,

Figure 10 is a perspective view of one of the wedges, and

Figure 11 is a sectional view through one of the blades.

Referring to the drawing in detail it will be seen that the numeral 5 denotes a hub provided with a bore 6 to receive shaft 7. The shaft 7 is provided with grooves 8 to receive ribs 9 in the bore 6. A plurality of split collars 10 are formed on the hub. These collars may be arranged in operatively disposed position as is indicated in Figure 8 or as is shown in Figure 3.

The blades 11 are curved longitudinally as is clearly illustrated in Figure 2 and also transversely as is clearly illustrated in Figure 11. These blades are formed with tapering shanks 12 to be received in the split collars 10. In the split collars 10 there are provided oppositely disposed series of notches 14 for the purpose of receiving ribs 15 on the shank 12.

These shanks are formed with transverse openings 17 which flare outwardly from the center as seen in Figure 9 and taper throughout their length as is shown in Figure 8. Elongated wedges 18 are adapted to be inserted through the slit portions of the collars in the openings 17 and through openings 19 in the collars and have threaded shanks 20 at their smaller end so that nuts 22 may be engaged therewith to tighten the wedges in place.

A bolt 23 extends through openings in the ears 24 formed on the collars and these bolts extend through slots 25 in the wedges 18. By loosening a nut 22 and a bolt 23 it will be seen that the pitch of the blade may be changed and held in the desired adjusted position by tightening the nut 22 and the bolt 23.

The structure therefore, is exceedingly sturdy and yet simple and easy to manipulate.

It is thought that the construction, adjustability and advantages of the invention will now be quite apparent to those skilled in this art without a more detailed description thereof.

The present embodiment of the invention has been disclosed in considerable detail merely for the purposes of exemplification since in actual practice it attains the features of advantage enumerated as desirable in the statement of the invention and the above description.

It will be apparent that changes in the details of construction, and in the combination and arrangement of parts may be resorted to without departing from the spirit or scope of the invention as hereinafter claimed or sacrificing any of its advantages.

Having thus described my invention, what I claim as new is:

1. A propeller of the class described comprising a hub having a plurality of split collars formed thereon, a plurality of blades having a shank receivable in the collars, said shanks having transversely disposed openings, the width of which taken longitudinally of the blades taper in one direction and the width thereof taken transversely of the blade flaring outwardly from the center, an elongated flat like wedge receivable in the openings, and means for tightening the wedges in place.

2. A propeller of the class described comprising a hub having a plurality of split collars formed thereon, a plurality of blades having a shank receivable in the collars, said shanks having transversely disposed openings, the width of which taken longitudinally of the blades taper in one direction and the width thereof taken transversely of the blade flaring outwardly from the center, an elongated flat like wedge receivable in the openings, said collars having openings to receive the smaller ends of the wedges, shanks extending from said smaller ends and nuts threaded thereon.

3. A propeller of the class described comprising a hub having a plurality of split collars formed thereon, a plurality of blades having a shank receivable in the collars, said shanks having transversely disposed openings, the width of which taken longitudinally of the blades taper in one direction and the width thereof taken transversely of the blade flaring outwardly from the center, an elongated flat like wedge receivable in the openings, said collars having openings to receive the smaller ends of the wedges, shanks extending from said smaller ends and nuts threaded thereon, bolts extending through the split collars and through slots in the wedges.

4. A propeller of the class described comprising a hub having a plurality of split collars formed thereon, a plurality of blades having a shank receivable in the collars, said shanks having transversely disposed openings, the width of which taken longitudinally of the blades taper in one direction and the width thereof taken transversely of the blade flaring outwardly from the center, an elongated flat like wedge receivable in the openings, said collars having openings to receive the smaller ends of the wedges, shanks extending from said smaller ends and nuts threaded thereon, bolts extending through the split collars and through slots in the wedges, said shank having longitudinal ribs and the interior of said collars being formed with notches to receive the ribs.

In testimony whereof I affix my signature.

CHARLES R. SCHULTZ.