Aug. 25, 1931. J. LISKA 1,820,467

AEROPLANE PROPELLER

Filed April 13, 1928

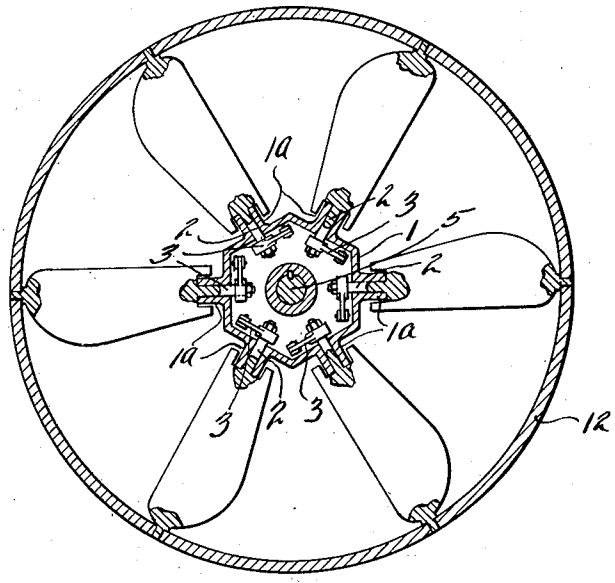


Fig.-1

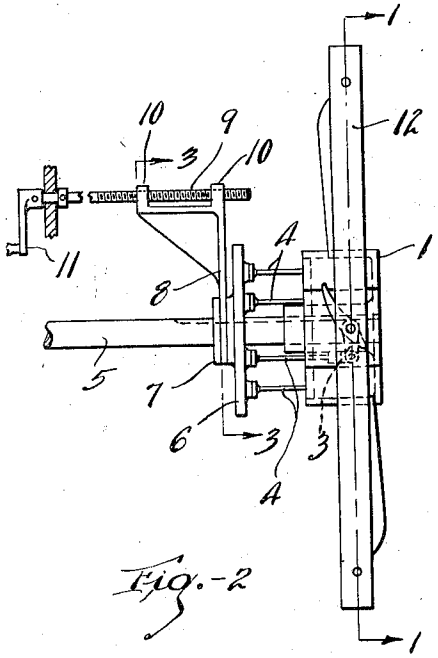


Fig.-2

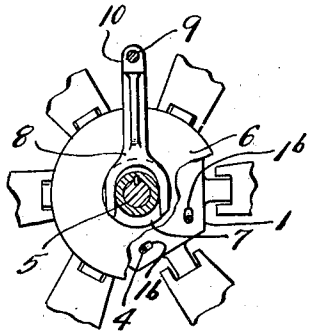


Fig.-3

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UNITED STATES PATENT OFFICE

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AEROPLANE PROPELLER

Application filed April 13, 1928. Serial No. 269,626.

This invention relates to an improved form of aeroplane propeller.

The object of the present invention is to devise an aeroplane propeller in which the blades are adjustable so as to vary their angle with respect to the direction of flight and thereby vary the air displacement of the propeller.

A further object consists in devising such an adjusting means which can be manipulated by the aeronaut during operation of the aeroplane.

Other objects will appear from the following description and claim when considered together with the accompanying drawings.

Fig. 1 is a view taken on line 1—1 of Fig. 2; Fig. 2 is a side elevation of my improved device; and Fig. 3 is a view taken on line 3—3 of Fig. 2.

The propeller may be provided with any desired number of blades, that is, two or more, there being six shown in the present illustration. Accordingly, the hub 1 is of a hexagon form, each of the six faces of the hub being provided with a bearing 1^a to afford pivotal mounting for the blades. The inner end of each blade has an axial projection 2 which extends through the corresponding bearing 1^a and which, in each case, has fixed connection with a lever arm 3. Each of the lever arms 3 is pivotally connected at its other end to the rod 4, these rods projecting through slots 1^b in the hub 1 and extending parallel with the propeller shaft 5 and having swivel connection at the equi-spaced points 6^a, with the plate 6. This plate is mounted upon the shaft 5 and has spline connection therewith so as to rotate therewith and at the same time may be adjusted therealong. The plate 6 has a yoke collar 7, in the annular groove of which engages the yoke 8 for slidable adjustment of the plate 6. Straight-line adjusting movement of the yoke member 8 is effected by means of the rod 9 which has threaded engagement with the ears 10 on the yoke member. The rod 9 is adapted for manipulation by means of the lever arm 11 which may be conveniently located within easy reach of the aeronaut at all times during operation of the aeroplane. The swivel connections 6^a and the slots 1^b permit movement of the plate 6 and rods 4 in the manner above described.

From the above-described mechanism, it will be seen that by rotary adjustment of the threaded rod 9, the plate 6 and rods 4 may be moved axially along the propeller shaft 5, thereby causing all of the blades to be simultaneously moved about their pivotal axes. Thus, the angular relation of the blades may be varied at any time. The outer ends of the blades may or may not be provided with pivotal mounting. The present illustration shows the blades pivotally mounted at their outer ends in the annular rim 12. It is to be understood that any desirable form of blade may be employed in my propeller, and that other modified forms of structure may be adopted without departing from the spirit of the present invention. All such modifications and variations are intended to be comprehended by the following claims.

With my adjustable blades, it is possible to vary the angle of the same and hence vary the air displacement. This means that under a given set of air conditions, greater air displacement may be obtained and consequently greater mileage may be realized from a given quantity of motor fuel. Also, it is possible to obtain greater speed under a given set of operating conditions of the motor. Furthermore, by adjusting the blades beyond a certain angle, it will be seen that reverse operating effect may be obtained; that is, the aeroplane could be propelled backwardly upon adjusting the blades to suitable degree.

The advantages, above briefly referred to, will prove of considerable value under all conditions, and the ability to adapt the propeller to the particular prevailing conditions will serve to produce maximum efficiency at all times. Other advantages resulting from this invention will be apparent to those who are familiar with the art to which it relates.

What I claim as new is:

The combination of an aeroplane propeller comprising a slotted hub, a plurality of blades mounted upon said hub for pivotal adjustment substantially about their longitudinal axes, a propeller shaft therefor extending

co-axially with said hub, lever mechanism for adjustment of the blades, said mechanism being arranged about said shaft, a disk having an annular groove and being slidably mounted upon said shaft and having operative connection with said lever mechanism for actuation of said disk, said operative connection comprising a plurality of rods arranged about the axis of said shaft and being swivelled at one end to said disk and extending through the slots in said hub, a yoke member adapted for straight-line movement and having its yoke arms terminating in the groove of said disk for effecting sliding movement of said disk, and screw-threaded means accessible to the operator and having direct operative engagement with said yoke member for manipulating the same, whereby the blades may be readily adjusted and retained in set position.

In testimony whereof, I hereby affix my signature.

JOSEPH LISKA.