E. JUELSON.

ADJUSTABLE PROPELLER BLADE.

APPLICATION FILED NOV. 11, 1918.

1,382,836. Patented June 28, 1921.

Fig. 1.

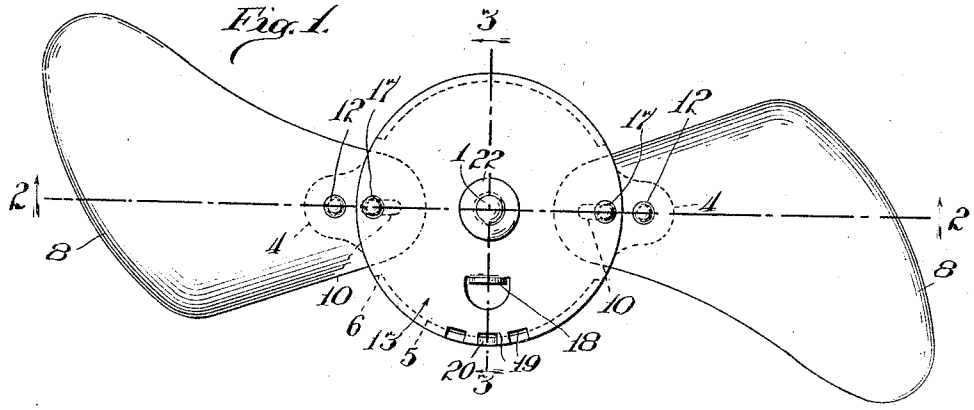


Fig. 2.

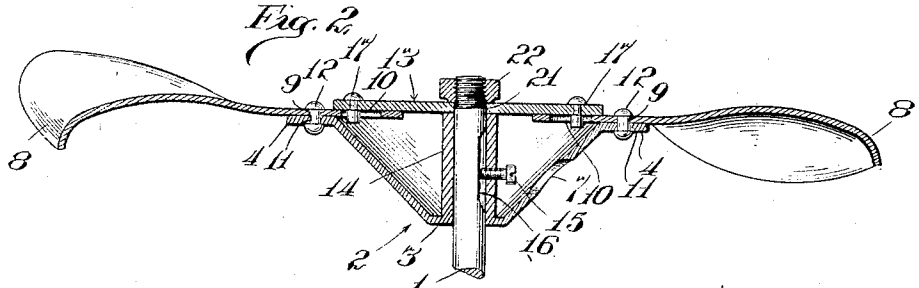


Fig. 4.

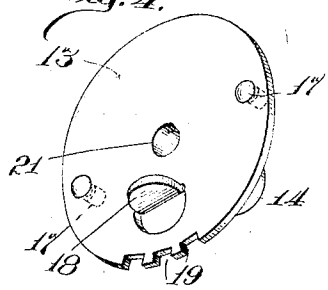


Fig. 6.

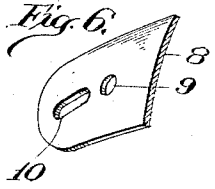


Fig. 5.

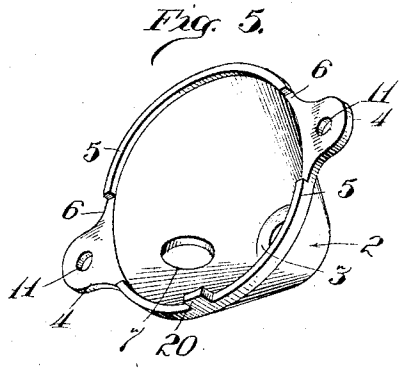
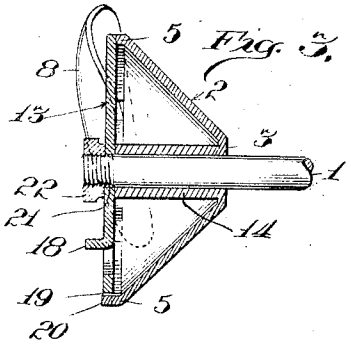


Fig. 3.



Inventor.

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UNITED STATES PATENT OFFICE.

EDWIN JUELSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO AMERICAN AERO COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

ADJUSTABLE PROPELLER-BLADE.

1,382,836. Specification of Letters Patent. **Patented June 28, 1921.**

Application filed November 11, 1918. Serial No. 261,966.

To all whom it may concern:

Be it known that I, EDWIN JUELSON, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented new and useful Improvements in Adjustable Propeller-Blades, of which the following is a specification.

The invention relates to propellers, and has for its principal object the provision of adjustable blades so that the circle of rotation may be varied within certain limits and thereby the air currents set up in axial direction with respect to the circle of operation may be concentrated or spread.

It is a further object of the invention to provide blades pivotally secured to the hub, so that each blade may be swung about its pivot to vary the distance of its outer extremity from the axis of rotation of the propeller.

It is also an object of the invention to provide means for simultaneously adjusting all of the blades.

Still another object embraces the provision of means for locking the blades in adjusted or readjusted position.

To the accomplishment of the objects stated and others that will become apparent as the description proceeds, the preferred embodiment of the invention comprises certain means described in the following specification, particularly set forth in the claims forming a part thereof, and illustrated in the annexed drawing.

In said drawing—

Figure 1 is a top plan view of a propeller constructed in accordance with my invention;

Fig. 2 is a longitudinal section of the improved propeller;

Fig. 3 is a transverse section of the propeller;

Fig. 4 is a perspective view of a disk;

Fig. 5 is a perspective view of the hub portion of the propeller, and

Fig. 6 is a fragmentary perspective view of the end portion of a blade.

Referring to the drawing, 1 designates a shaft to which a hub, generally designated by 2, is secured. The hub, of frusto-conical form, is open at its wide end and closed at its narrow end by an integral bottom portion 3 provided with an aperture for the passage of the shaft 1. The wide end of the hub has apertured lugs 4, arranged at diametrically opposite points of the hub and extending at right angles to the longitudinal axis of the hub. The wide end is furthermore equipped with sectional flanges 5, having spaced portions, as at 6, adjacent to the lugs. The wall of the hub is equipped with an opening 7, which affords access to the interior.

The blades 8 are of a shape and construction to insure positive actuation of the air sheared loose from the atmosphere during rotation, and, as indicated, are spoon-shaped, whereby maximum effect is insured. The form of the propeller blades, however, does not form an object of this invention, and is immaterial as far as the scope of the present invention is concerned. Each blade 8 at its inner end portion is provided with a circular aperture 9 and a short distance therefrom with an elongated slot 10, for purposes presently to be described. The aperture 9 of the blade is placed in registry with an aperture 11 of the lug 4 of the hub, and a rivet 12 in said registering apertures constitutes a pivotal connection between the hub and the blade. It is evident that the rotation of the blade about the pivot 12 will change the distance of the outer blade extremity from the axis of the shaft 1 so as to increase or decrease such distance and thereby to vary within practical limits the size of the circle of rotation described by the blades.

Coacting with the blades is a disk 13 (shown in Fig. 4) of circular form and provided with a depending sleeve 14 formed integral with the disk or, if preferred, formed separate and secured to the disk 13. As indicated in Fig. 2, the sleeve 14 is of a length to bear with its inner, or lower, portion against the bottom portion 3 of the hub. The hub 3 is provided with an aperture for the passage of a set-screw 15, which enters a longitudinal groove 16 in the shaft to secure the hub and its associated parts against rotation on the shaft.

The disk 13 is provided with a plurality of pins 17, arranged at diametrically opposite points in the disk and at a distance from the center to enter, in the assembled relation of the parts, the slots 10 of the blade ends. The disk 13, in the assembled relation of the propeller, is arranged on the sectional flanges 5 of the hub defining with lugs 4 of the hub spaces for the passage of the inner

ends of the blades. Upon rotation of the disk 13 the pins 17 cause a corresponding oscillation of the blades 8, so that both blades of the propeller are simultaneously adjusted to desired position.

To facilitate rotation of the blade, a tongue 18 is struck out from the disk which serves as a gripping means whereby the disk may be adjusted. The latter is also equipped at a portion of its periphery with a plurality of recesses 19, which are adapted to receive a lug 20, arranged on the hub 2. The disk 13 has a central aperture 21 for the passage of the shaft 1, which, at the outer portion, is threaded for the reception of a nut 22.

The adjustment of the blades can be effected in the following manner:

Assuming the lug 20 to be received in the central recess 19 of the disk 13, the nut 22 is loosened and the disk 13 is slightly lifted in order to release the latter from the hub by clearing the lug, and thereupon the disk is rotated in either clockwise or counter-clockwise direction until another of said recesses is placed in registry with the lug 20. Thereupon the nut 22 is tightened to secure the parts in assembled relation. The rotation of the disk 13 by the agency of the pin 17 causes a slight oscillation of the blades 8, whereby adjustment of the latter is effected to vary the circle of rotation of the same, either concentrating or spreading the air currents set up by the operation of the propeller.

While the drawing discloses the preferred embodiment of the invention, it is, of course, understood that the invention is not limited to the exact details as shown but includes such modifications as fall within the scope of the claims.

I claim:

1. A propeller, comprising a disk, a hub, blades pivotally secured thereto, means arranged on said disk for engaging the inner ends of said blades, and means for rotating said disk.

2. A propeller, comprising a hub constituting a hollow truncated cone open at the wide end, blades pivotally secured to the wide end of the hub, a rotatable disk forming a cover for said hub, and means on said disk for engaging the inner ends of said blades.

3. A propeller, comprising a hub constituting a hollow truncated cone open at the wide end, blades pivotally secured to the wide end of the hub, a rotatable disk forming a cover for said hub, means on said disk for engaging the inner ends of said blades, and means for securing the disk in position.

4. A propeller, comprising a hub constituting a hollow truncated cone open at the wide end, blades pivotally secured to the wide end of the hub, a rotatable disk forming a cover for said hub, means on said disk for engaging the inner ends of said blades, said disk being formed with a plurality of recesses adapted to be placed in registry with a lug on said hub, and a tongue struck out from said disk to facilitate rotation thereof.

5. A propeller, comprising a hub constituting a hollow truncated cone open at the wide end and having apertured lugs extending at right angles to the longitudinal axis and outwardly therefrom, blades pivotally secured to said lugs and extending with their inner ends past the wall of said hub, a disk forming a cover for said hub and having pins entering slots provided in the ends of said blades, means for securing the disk in position, and means for rotating said disk.

6. In a propeller a hub, two or more wings pivoted to said hub on axes substantially parallel to the axis of the latter, and means angularly adjustable about the axis of said hub and engaging said wings to secure them in adjusted position.

In testimony whereof I affix my signature in the presence of two witnesses.

EDWIN JUELSON.

Witnesses:

DANIEL A. BRENNAN,

IRMA BECK.