Dec. 26, 1950 A. S. BARKLEY 2,535,527

MODEL AIRPLANE PROPELLER

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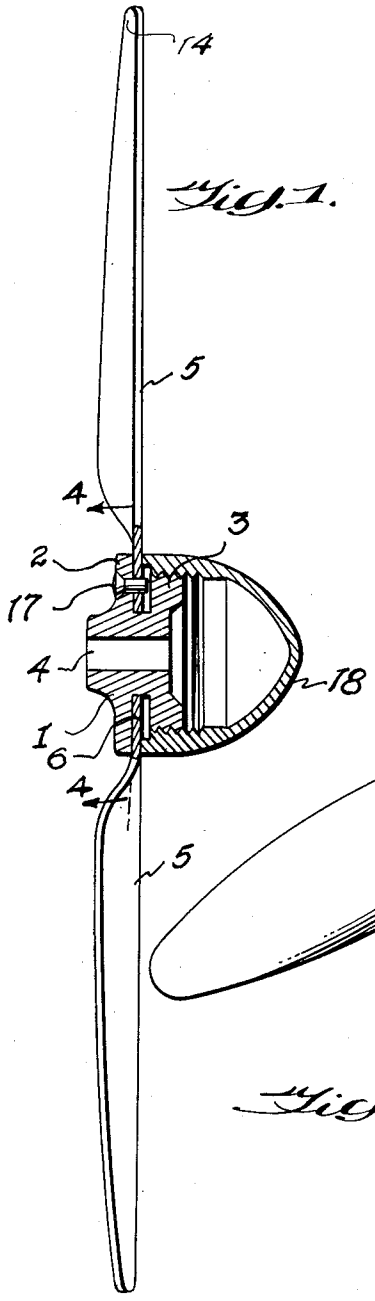


Fig. 1.

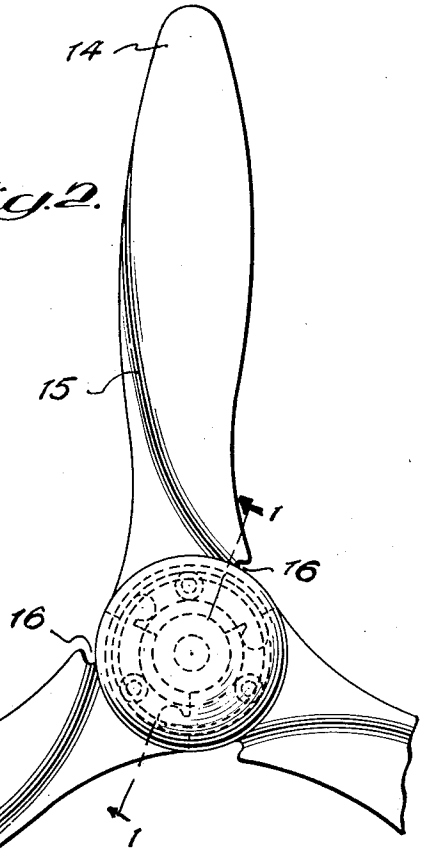


Fig. 2.

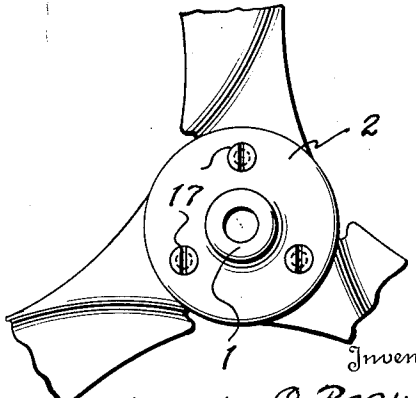


Fig. 3.

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Fig. 4

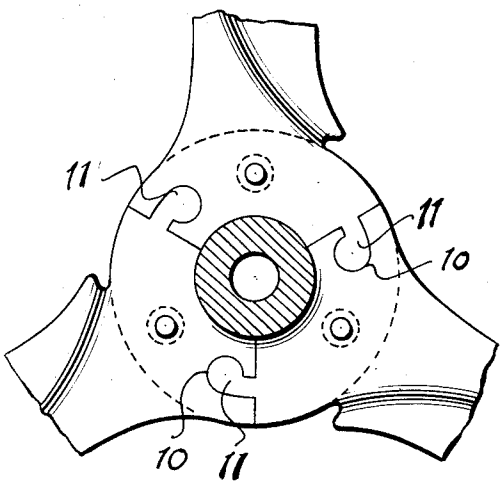


Fig. 6

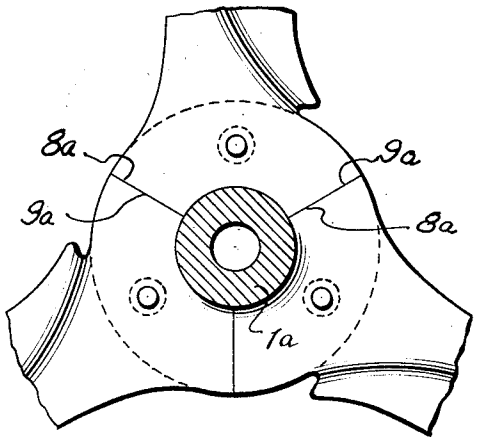


Fig. 5

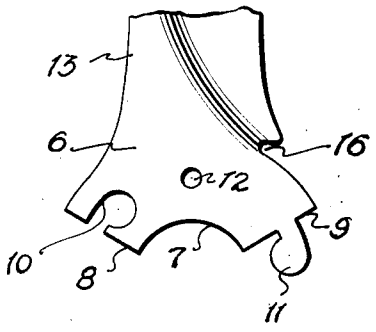
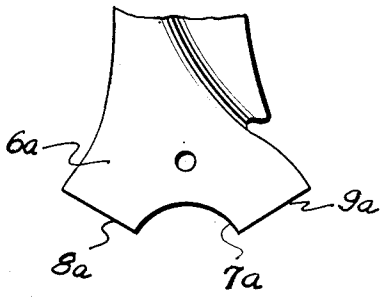


Fig. 7



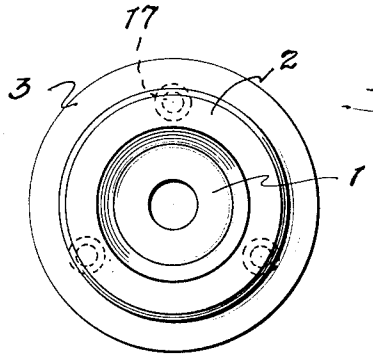


Fig. 8

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Patented Dec. 26, 1950 2,535,527

UNITED STATES PATENT OFFICE

2,535,527

MODEL AIRPLANE PROPELLER

Archiebald S. Barkley, Detroit, Mich.

Application August 15, 1946, Serial No. 690,740

3 Claims. (Cl. 170—159)

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This invention relates to propellers for model powdered aircraft and has for its object to provide a propeller of excellent efficiency which can be readily balanced, which can be produced very economically, which lends itself to accurate mass production and which will be so sturdily assembled that there will be no danger of disassembly or disintegration in operation.

Another object is to provide a propeller composed essentially of a hub, blades and a nose, the blades when assembled on the hub re-inforcing each other and being doubly locked on the hub by means of holding means individual to each of them together with additional means securing them jointly in position on the hub.

More specifically it is an object of the invention to provide a hub and blades, each blade having a hub portion which abuts the hub portions of the adjacent blades, and preferably interlocks therewith, means securing each b'ade hub portion directly to the hub, and a nose which is screw threaded onto the hub for pressure contact with each blade portion.

A further object of the invention is to provide a simplified starting means for the motor of the aircraft, this starting means being in the form of a hub nose around which a string or cord may be wound for several turns, one end of the cord being knotted for engagement with a notch in a propeller blade, the other end of the cord being adapted to be pulled by an operator thus cranking the motor.

More particularly it is an object to provide propeller blades each having a cord engaging notch immediately adjacent the hub nose, the propeller blade being so formed and the notch position being so se'ected that an energetic pull on the cord will not deflect the blade nor distort the hub.

Other objects and advantages will become hereinafter more fully apparent as reference is had to the accompanying drawings in which my invention is illustrated and in which:

Figure 1 is an axial diametric section through my improved propeller taken along the line 1—1 of Figure 2,

Figure 2 is a frontal elevation taken from the right side of Figure 1,

Figure 3 is a rear elevation taken from the left side of Figure 1, the blades being only partially shown,

Figure 4 is a transverse section taken along the line 4—4 of Figure 1, the blades being only partially shown,

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Figure 5 is a front elevation of a blade hub portion,

Figure 6 is a view of a modification of blade formation and arrangement similar to the view of the preferred form shown in Figure 4,

Figure 7 is front elevation of the hub portion of a modified blade as shown in assembly in Figure 6, and

Figure 8 is a front elevation of the hub with the nose removed.

More particularly, 1 refers to a propeller hub portion having a narrow radial flange 2 extending outwardly near one end thereof and a second wider radial flange 3 longitudinally spaced from the flange 1. The flange 3 has a smaller diameter than the flange 1 and is threaded externally throughout its length. The hub portion 1 has an opening 4 longitudinally therethrough to receive the shaft of an engine (not shown). The hub portion 1 and the flanges 2 and 3 together constitute the hub.

A plurality of propeller blades 5 are adapted for individual attachment to the hub. While any desired number of blades may be used, I illustrate three. The blades each have a hub portion 6, best illustrated in Figure 5, having an arcuate portion 7 the radius of which substantially equals the exterior of the hub 1 between the flanges 2 and 3 for close fitting engagement therewith. Outwardly of the portion 7 the edges 8 and 9 are on radial lines from the center of the arc of the portion 7. The edge 8 is interrupted by a curved cut-out 10 and the edge 9 has a projection 11 formed in counterpart of the cut-out 10. Circumferentially between the cut-out 10 and the projection 11 is a threaded hole 12 which receives a holding screw as will be hereinafter described. The root 13 of the blade radiates outwardly from this hub portion 6, the blade increasing in width beyond the root and thereafter decreasing in width to the tip 14. The entire blade is made of sheet metal. The hub portion is co-planar with part of the root and the blade is bent on a curved diagonal line 15 which starts about two-thirds outwardly of the length of the blade and sweeps transversely thereacross to a notch 16 formed at the junction of the root 13 and hub portion 6.

Since the propellers illustrated in the drawings have three blades, each arcuate portion 7 is 120°. Thus when three blades are assembled on a hub portion 1 between the flanges 2 and 3 they form a closed circle therearound and a projection 11 of each blade interfits with a notch 10 of an adjacent blade. Also an edge 8 and 9 of each blade abuts the edges 9 and 8 respectively of the ad-

jacent blades. The flange 2 has three threaded openings therethrough to receive screws 17 which thread into the openings 12 of each blade.

A nose 18, internally threaded, screws onto the threads of the flange 3 to the extent that it presses firmly against the blade hub portions 6. The outside diameter of the nose 18 adjacent the blades is substantially the same as the outside diameter of the flange 2 and the notch 16 of each blade has its lower side substantially at the level of the surface of the flange 2 and nose 16.

The nose 18 extends outwardly from contact with the blades for a short distance cylindrically and then tapers arcuately to a point. Since it is contemplated that the crankshaft of the engine with which it is to be used will turn counterclockwise the notches 16 are at the right edges of the blades and the threads of the nose and flange 3 are left-handed. When a starter cord is knotted at one end and the knot caught in a notch 16 the cord may be wound around the nose several times so that when the outer end of the cord is pulled the propeller and hence the engine can be turned through several revolutions.

In Figure 7 the hub portion 6*a* is essentially the same as the hub portion 6 except that the notches 10 and the projections 11 are omitted. The arcuate portion 7*a* is 120° in length and the edges 8*a* and 9*a* are radial from the center of the arc of the portion 7*a*. Thus when three of these hub portions 6*a* are assembled on a hub 1*a*, as illustrated in Figure 6, the edge 8*a* of each blade will abut the edge 9*a* of the adjacent blade, exactly as described in connection with the construction of Figure 4 except that there are no inter-locking notches and projections.

It will be apparent to those skilled in the art that a greater or lesser number of blades may be used, and also that my improved hub assembly may be used with various shapes of propeller blades without departing from my invention and I therefore desire to be extended protection as defined by the appended claims.

What I claim is:

1. A propeller comprising a hub having a radial groove therein, one wall of said groove having screw holes therethrough, the peripheral surface of the other wall of said groove being threaded, propeller blades having hub-engaging portions extending into said groove, said hub-engaging portions each having a threaded opening therethrough opposite the holes in said groove wall, screws securing each of said hub-engaging portions to the first named wall, and a hub nose threaded onto the peripheral surface of said other wall of the groove, said nose being traversed on its threads into pressure engagement with all of said hub engaging portions.

2. A propeller comprising a hub having a radial groove therein, one wall of said groove having screw holes therethrough, the peripheral surface of the other wall of said groove being threaded, propeller blades each having arcuate hub-engaging portions extending into said grooves and each having a circumferential length sufficient to abut the hub engaging portions closely fitting the bottom of said groove and each having a threaded hole opposite one of the screw holes through the first mentioned wall of said groove, screws securing each of said hub-engaging portions to said first wall and also firmly aligning said hub-engaging portions in mutually abutting relation with adjacent hub-engaging portions, and a hub nose threaded on the periphery of said other wall of the groove to a distance such that the end of said nose is in pressure contact jointly with all of said hub-engaging portions.

3. A propeller comprising a hub having a radial groove therein, one wall of said groove having screw holes therethrough, the peripheral surface of the other wall of said groove being threaded, propeller blades each having arcuate hub-engaging portions extending into said grooves and having edges which are radial from the center from which the arc of said arcuate portion is swung, said edges having projections and notches engaging respectively the notches and projections of adjacent hub-engaging portions, each of said hub engaging portions closely fitting the bottom of said groove and each having a threaded hole opposite one of the screw holes through the first mentioned wall of said groove, screws securing each of said hub-engaging portions to said first wall and also firmly aligning said hub engaging portions in mutually abutting relation with adjacent hub-engaging portions, and a hub nose threaded on the periphery of said other wall of the groove to a distance such that the end of said nose is in pressure contact jointly with all of said hub-engaging portions.

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