Nov. 8, 1932. J. W. PRICE 1,887,429

PROPELLER CONSTRUCTION

Filed Sept. 2, 1931

Fig. 1.

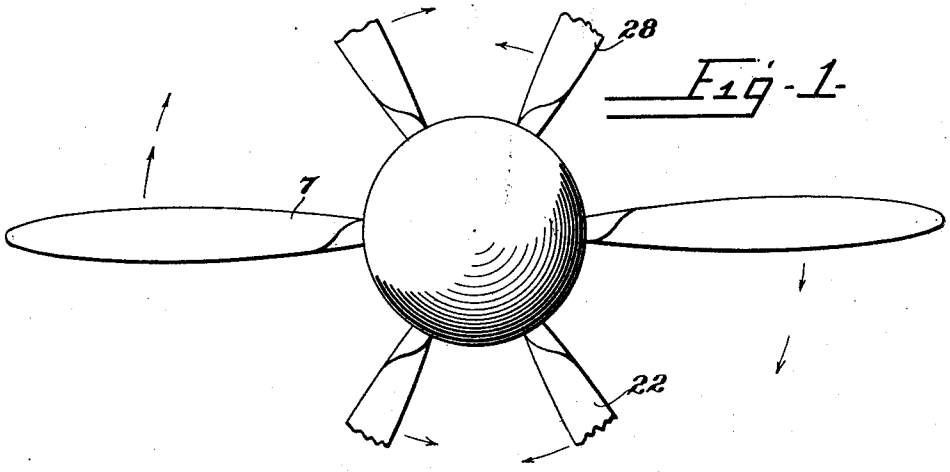


Fig. 2.

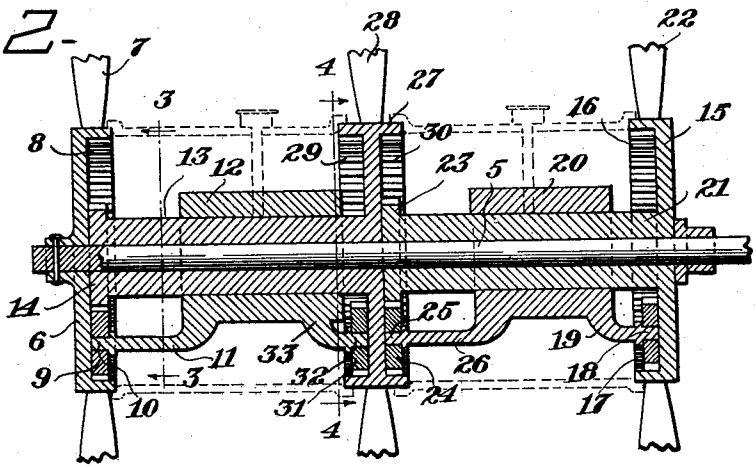


Fig. 3.

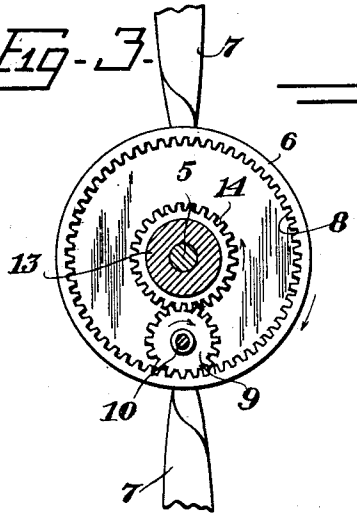
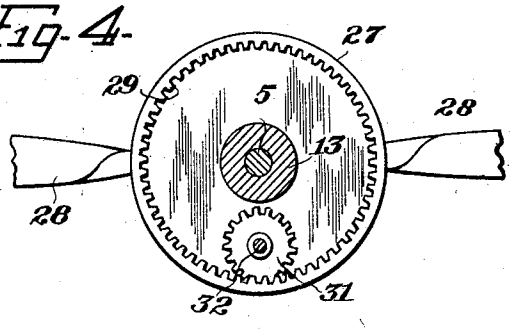


Fig. 4.



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PROPELLER CONSTRUCTION

Application filed September 2, 1931. Serial No. 560,842.

The invention relates to a propeller construction for airplanes or the like, and more especially to multiple propellers and driving mechanism therefor.

The primary object of the invention is the provision of a propeller construction of the character specified wherein an increased speed and maximum carrying power is had in the use thereof with an airplane or the like, the arrangement of the multiple propellers and the driving mechanism thereof being novel in form.

Another object of the invention is the provision of a propeller construction of the character specified, wherein the take-off of the airplane can be effected much faster and also in a minimum space and also when said airplane or the like is in flight, the slipping thereof or other dangers arising when encountering air pockets will be eliminated.

A further object of the invention is the provision of a propeller construction of the character specified, wherein the use of the same increases the efficiency of the horsepower of the motor with a minimum consumption of fuel and also practically eliminates the gyroscopic effect of a single propeller.

A still further object of the invention is the provision of a propeller construction of this character which is comparatively simple in construction, thoroughly reliable and efficient in operation, practical in all details and inexpensive to manufacture and install.

With the foregoing and other objects in view, the invention consists in the features of construction, combination and arrangement of parts, as will be hereinafter more fully described in detail, illustrated in the drawing which discloses the preferred embodiment of the invention, and pointed out in the claim hereunto appended.

In the accompanying drawing:—

Figure 1 is a fragmentary front elevation of a propeller construction in accordance with the invention.

Figure 2 is a vertical longitudinal sectional view therethrough.

Figure 3 is a sectional view on the line 3—3 of Figure 2, looking in the direction of the arrows.

Figure 4 is a sectional view on the line 4—4 of Figure 2, looking in the direction of the arrows.

Similar reference characters indicate corresponding parts throughout the several views in the drawing.

Referring to the drawing in detail, 5 designates the forward projecting portion of the drive shaft of an airplane motor (not shown), the latter being of any preferred standard construction and on the outer end of this shaft is fixed in any suitable manner the hollow hub 6 of a master propeller having the opposed propeller blades 7, the hollow hub 6 being formed with an internal gear 8 meshing with a pinion 9 supported for rotation upon a journal 10 formed on an arm 11 of a stationary sleeve-like housing 12, the latter encircling a sleeve-like shaft 13 carried by the drive shaft 5.

The forward end of the sleeve-like shaft 13 is formed with a gear 14 which is confined with the hub 8 of the master propeller and meshes with the pinion 9 so that rotation is imparted from the master propeller to the sleeve-like shaft 13, as will be obvious.

Arranged rearwardly of the master propeller and spaced the required distance inwardly therefrom is the inner auxiliary propeller, including a hollow hub 15 provided with an internal gear 16 meshing with a counter-balancing pinion 17 on a journal 18 of the arm 19 projected from a stationary housing 20 encircling a sleeve-like shaft 21 formed integral with the hub 15 of the auxiliary propeller. It is, of course, understood that the hub 15 is provided with opposed propeller blades 22 and the forward or outermost end of the sleeve-like shaft 21 is formed with a gear 23, the latter meshing with a pinion 24 on a journal 25 of an arm 26 extending from the housing 20.

Formed on the inner end of the sleeve-like shaft 13 is an intermediate auxiliary propeller, including a hollow hub 27 provided with opposed propeller blades 28, the hub being formed with internal gears 29 and 30 opposite one another, the gear 29 being in mesh with a pinion 31 carried by a journal 32 of an arm 33 on the housing 12, while the

gear 30 meshes with the pinion 24 on the arm 26 of the housing 20. The pinion 31 acts correspondingly to the pinion 17, namely, as a counter-balancing pinion, while transmission of power from the master propeller is effected to the auxiliary inner and intermediate propellers through the pinions 10 and 24 and the internal gears of the hubs of the said master propeller and intermediate propeller.

It will be observed that in the starting of the motor in the aeroplane, the drive shaft 5 will turn the master propeller and through its internal gear 8, power will be transmitted through the pinion 10 to the gear 14 on the sleeve shaft 13 to the hub 27 of the intermediate propeller and the latter, through the gear 30, will impart power by transmission through the pinion 24 and gear 23 to the sleeve shaft 21 and thence to the inner propeller, so that in the use of the multiple propellers, an increased speed of travel is had and a maximum carrying capacity of power effected for the airplane.

It will be apparent that the master and the innermost auxiliary propeller rotate in the same direction, while the intermediate auxiliary propeller turns in a reverse direction, and in this manner, in the use of the multiple propeller construction, the speed of the airplane is boosted to effect a quick take-off and to relieve danger as well as the slipping of the airplane when encountering air pockets during flight.

It is of course to be understood that in the manufacture of the structure hereinbefore described the main shaft 5 will have its bearing encased so as to contain oil for lubricating purposes and likewise the gearing in its arrangement will be encased for receiving oil so that such gearing will constantly travel in a bath of oil for the proper lubrication of the construction.

What is claimed is:—

In a propeller construction, a motor drive shaft, a series of spaced propellers having internally gear toothed hubs mounted upon said shaft, means fixing the hub of one propeller to said shaft, sleeve-like shafts formed with the hubs of the remaining propellers and encircling said drive shaft, gears formed on the sleeve-like shafts, stationary housings receiving the sleeve-like shafts, and pinions supported by said housings and meshing with the internally gear toothed hubs and the gears on the sleeve-like shafts.

In testimony whereof I affix my signature.

JOE W. PRICE.