

J. M. RITCHIE.
PROPELLER.

APPLICATION FILED JULY 16, 1912.

1,125,719.

Patented Jan. 19, 1915.

2 SHEETS-SHEET 1.

Fig. 1.

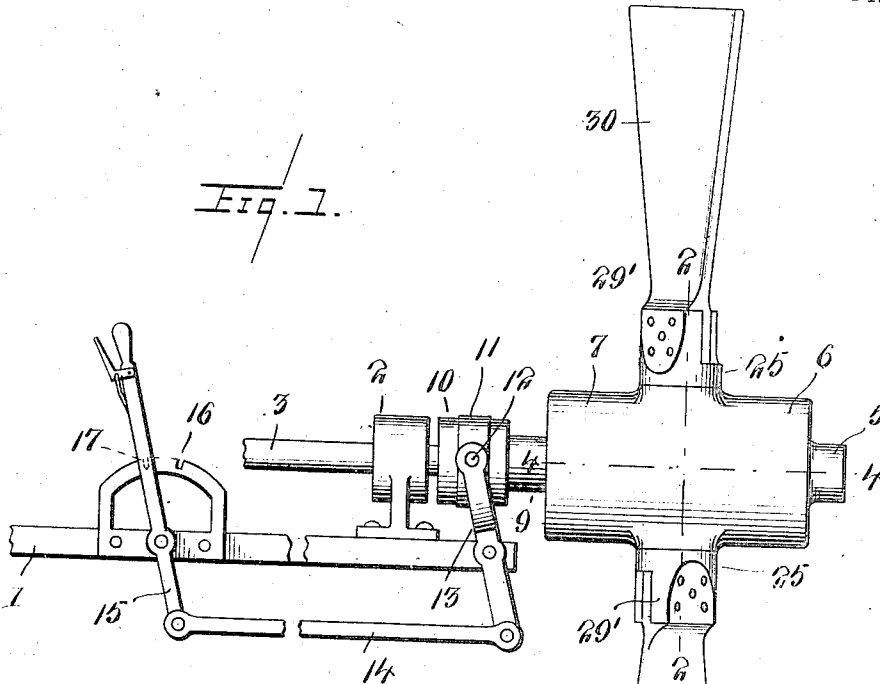


Fig. 2.

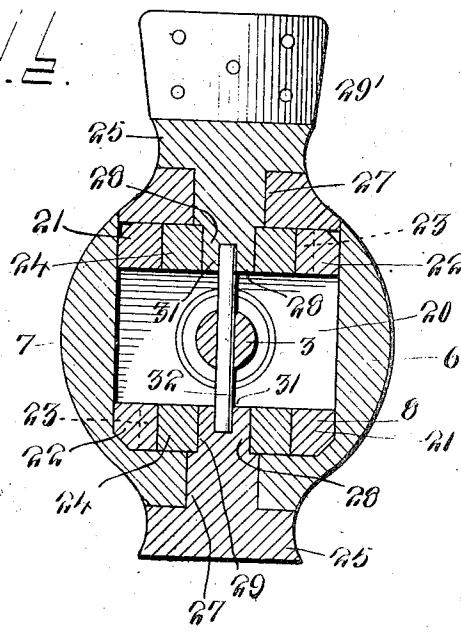
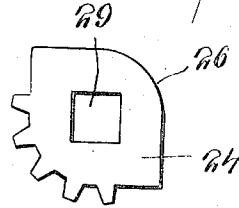


Fig. 3.



Witnesses
E. Q. Ruppert.
E. E. DuPont.

Inventor
J. M. Ritchie

By Victor J. Evans

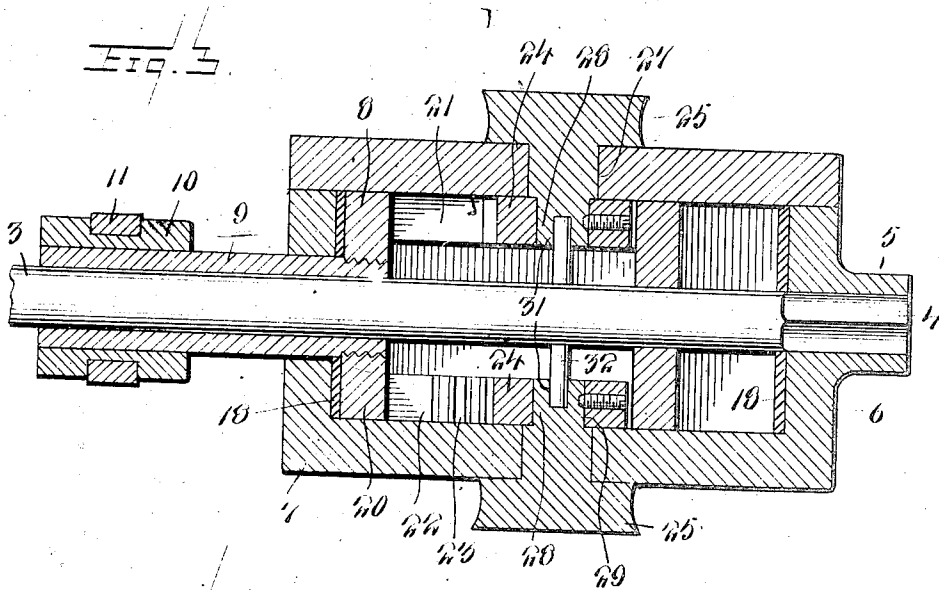
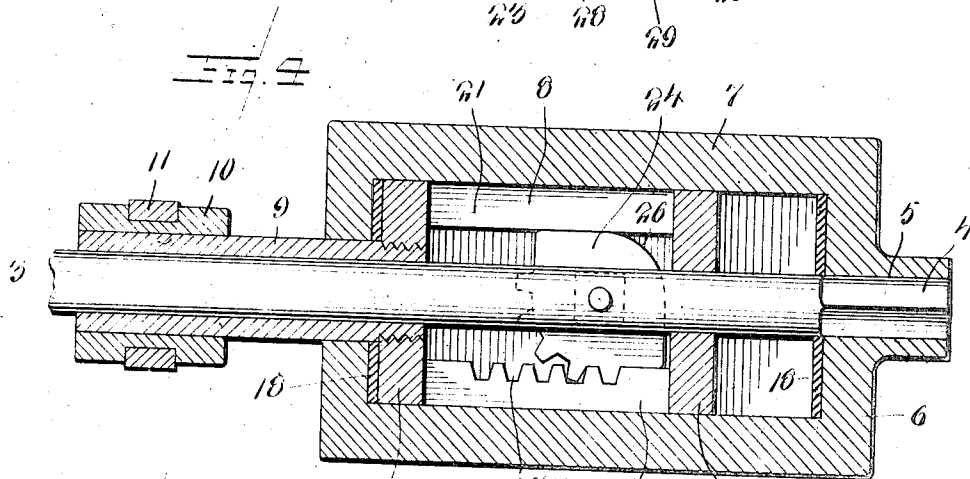
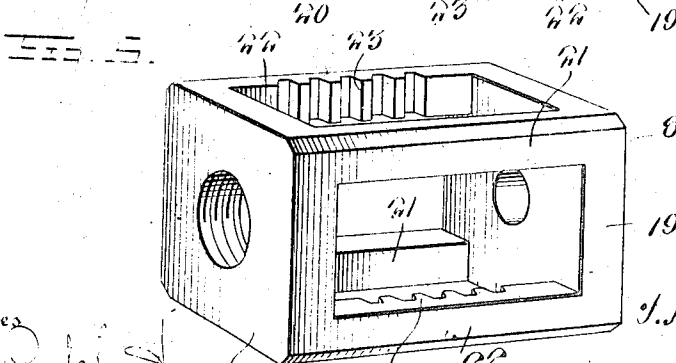
Attorney

J. M. RITCHIE.
PROPELLER.
APPLICATION FILED JULY 16, 1912.

1,125,719.

Patented Jan. 19, 1915.

2 SHEETS—SHEET 2.



Witnesses
E. W. Campbell
Edmundson

Inventor
J. M. Ritchie

By Victor J. Evans

Attorney

UNITED STATES PATENT OFFICE.

JACOB M. RITCHIE, OF MICHIGAN CITY, INDIANA.

PROPELLER.

1,125,719.

Specification of Letters Patent.

Patented Jan. 19, 1915.

Application filed July 16, 1912. Serial No. 709,717.

To all whom it may concern:

Be it known that I, JACOB M. RITCHIE, a citizen of the United States, residing at Michigan City, in the county of Laporte and State of Indiana, have invented new and useful Improvements in Propellers, of which the following is a specification.

This invention relates to propellers and more particularly to aeroplane propellers.

One of the principal objects of the invention is to provide a simple and efficient device of this character which may be reversed while the engine is running at full speed so that, should the aviator break a wing or otherwise damage his machine, and start to falling head first, he could reverse the propeller, and by this means sustain most of the weight of the machine or all of it so that the force of gravity would be reduced or offset, whereby the fall is made light and practically no damage will result.

Further objects of this invention will appear as the following specific description is read in connection with the accompanying drawing, which forms a part of this application, and in which:—

Figure 1 is a detail side elevation showing the propeller mounted upon a portion of an aeroplane. Fig. 2 is a vertical section on the line 2—2 of Fig. 1. Fig. 3 is a vertical longitudinal section. Fig. 4 is a horizontal longitudinal section taken on the line 4—4 of Fig. 1. Fig. 5 is a perspective view of the rack frame. Fig. 6 is an elevation of one of the gear segments.

Referring more particularly to the drawing, 1 represents a supporting part upon an aeroplane or other type of air ship and mounted upon this part are suitable bearings 2 in which the engine or propeller shaft 3 is journaled. The outer end of this shaft is squared, as shown at 4, so as to enter a squared socket 5 formed in the head 6 of the propeller hub 7. This propeller hub is hollow so as to receive a rectangular rack frame 8 to be hereinafter described. The shaft 3 has slidably mounted thereon a sleeve 9 which is threaded into one end of the rack frame, as shown, and the threads preferably running in a direction opposite to the travel of the propeller so as to insure tight engagement of the sleeve 9 with the frame 8 at all times. This sleeve carries an annularly grooved collar 10 which is provided with a shifting ring 11 lying in the groove and having laterally extended pins 12 which are

engaged by the bifurcated lever 13 upon the support 1. The lower end of the lever 13 is connected by means of the link 14 to a controlled lever 15 also pivoted upon the support and operating over a notched segment 16 which is adapted to be engaged by the spring pressed pawl 17 for locking the lever in adjusted position. When this lever is operated in either direction, the sleeve 9 and consequently the gear frame 8 will be shifted upon the shaft 3, and in order to prevent the shock which would otherwise occur if the frame were allowed to strike the opposite ends of the hub, there is secured in the ends of the hub, suitable cushioning buffers 18.

The frame 8 comprises the squared end plates 19 and 20 connected together at each corner by bars 21 and 22, the latter of which have rack faces 23 adapted to be engaged by the toothed segments 24 which are keyed to the ends of the propeller mounting heads 25 and which have the face opposite the toothed portion curved, as shown at 26, so as to bear against the connecting bars 21 which act to hold the segments in engagement with the rack bars. These heads 25 have a reduced portion 27 which is journaled in the hub and a further reduced and squared portion 28 which enters the squared apertures 29 formed in each segment. The upper or outer ends of the heads 25 are suitably flanged, as shown at 29, and to these flanges are secured the propeller blades 30. In order to secure a more firm bearing for the heads 25, the same are provided with recesses in their ends, as shown at 31, to receive the ends of the engine or propeller shaft 3. When the lever 15 is shifted to its rearward position, the rack frame will be moved rearwardly in the hub and the rack faces being in engagement with the toothed segment, will cause said segments to turn and the propeller blades will be thereby rotated so as to change their position.

It will be noticed that this invention has many advantages outside of the ones previously recited. For instance, if an aviator desires to alight or to coast, dip, or dive, he may readily set the propeller blades to a neutral or intermediate position without stopping his engine, and in this position, the engine may be started without having any one to hold the machine while the engine is being tuned up or obtaining its required speed. By then throwing the lever forward, the propeller blades may be turned

so as to throw them into operative position for starting the flight or for continuing the same after coasting. If the aviator desires to alight after a flight, and finds that his
5 speed is too great for safety, he may reverse the propellers and slacken up the speed without cutting out his engine. This same procedure may also be adapted, as before stated, to sustain or partially sustain the
10 machine in case of broken parts. It will, of course, be also understood that this type of propeller may be readily used with motor boats and like devices.

What is claimed is:—

15 In a reversible propeller, the combination of a hollow hub, a driving shaft passing through the hub and being connected fixedly therewith, radial propeller blades journaled in the hub, a rack frame slidably mounted
20 within the hub for longitudinal movement and being provided with longitudinal slots having parallel longitudinal walls, a toothed rack formed upon one longitudinal wall of each frame slot, an operating segment
25 mounted fixedly upon the inner end of each

propeller, each segment being substantially square in form and having two opposite corners thereof rounded concentric to its axis, the opposite rectangular corners of the segment being adapted to provide flat limit- 30 ing faces, gear teeth provided upon one of the rounded corners of each segment for engagement with the rack of the corresponding frame slots, each operating segment being longitudinally movable within 35 the corresponding frame slots and having its limiting faces adapted for engagement with the opposite longitudinal walls of the slot, parallel limiting faces of the segments being engageable with the said frame slot 40 walls when the segment is positioned in either of its terminally disposed positions within the slot, and means for reciprocating the frame within the hub.

In testimony whereof I affix my signature 45 in presence of two witnesses.

JACOB M. RITCHIE.

Witnesses:

L. A. THAYER,
E. C. KING.