D. CROCKETT.

PROPELLER.

APPLICATION FILED JUNE 4, 1910.

1,005,812.

Patented Oct. 17, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

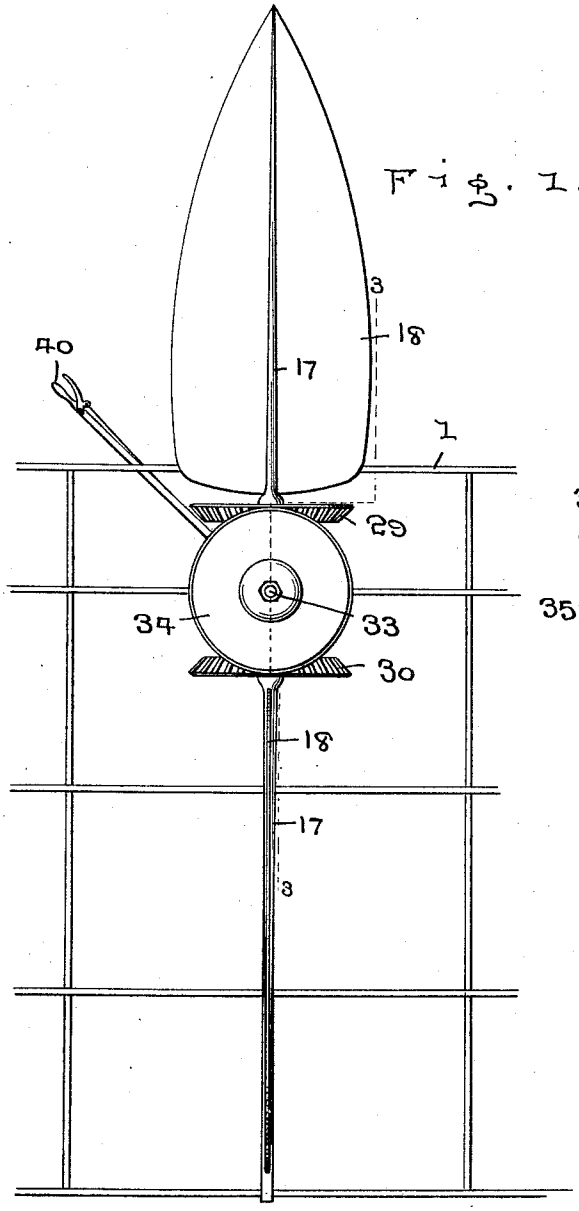
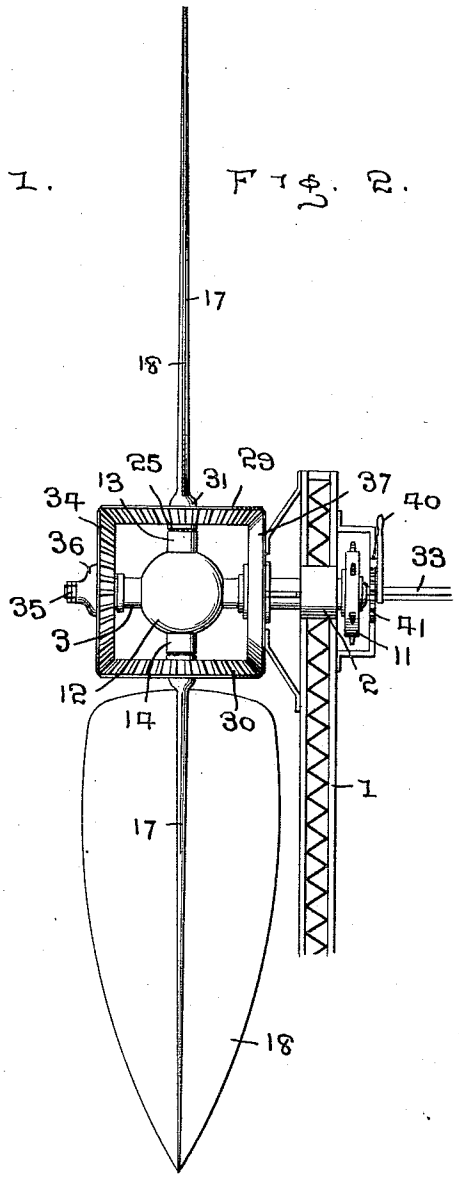


Fig. 2.



WITNESSES:

Thos. W. Reay

M. Newcomb.

INVENTOR

D. Crockett

BY

W. J. FitzGerald & Co.

Attorneys

D. CROCKETT.

PROPELLER.

APPLICATION FILED JUNE 4, 1910.

1,005,812.

Patented Oct. 17, 1911.

2 SHEETS—SHEET 2.

Fig. 3.

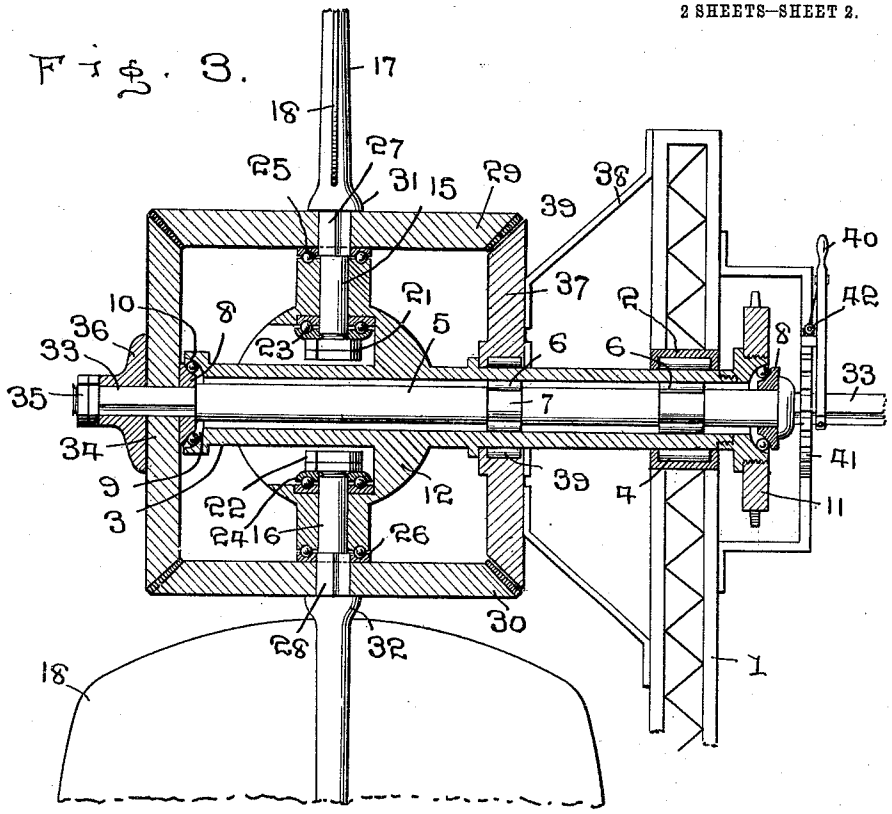


Fig. 4.

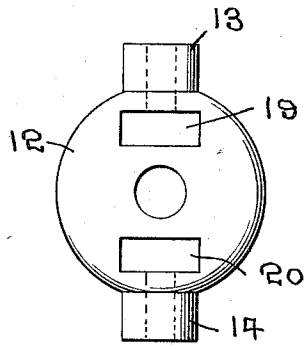
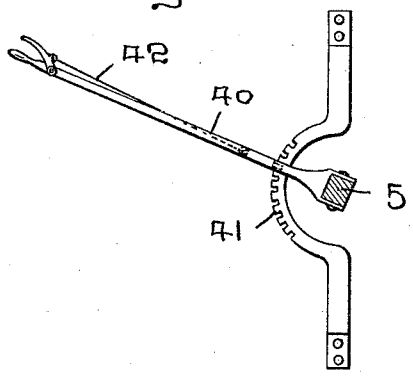


Fig. 5.



WITNESSES:

Thos. W. Riley

M. Newcomb.

INVENTOR

D. Crockett

BY

W. J. Fitzgerald & Co

Attorneys

UNITED STATES PATENT OFFICE.

DAVID CROCKETT, OF BIRMINGHAM, ALABAMA.

PROPELLER.

1,005,812. Specification of Letters Patent. Patented Oct. 17, 1911.

Application filed June 4, 1910. Serial No. 565,023.

To all whom it may concern:

Be it known that I, DAVID CROCKETT, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Propellers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to new and useful improvements in propellers adapted to be used primarily in connection with flying machines or similar devices, and my object is to provide specific improvements in the parts of a propeller of the class having a pair of blades, which, when rotated, will propel the object to which the blades are attached, means for rotating the blades around an axle, means to cause said blades to rotate with their stems while being revolved around the axle, means for applying power to the blades, and, means for rotating the axle to change the angle of the blades, whereby the blades will serve to elevate or lower the object to which they are attached.

With these objects in view, the invention consists in the improved construction, arrangement and combination of parts hereinafter described and particularly pointed out in the claims hereunto appended.

In the accompanying drawings which are made a part of this application, Figure 1 is a side elevation of the propelling blades showing the same mounted upon a frame. Fig. 2 is an edge elevation thereof. Fig. 3 is an enlarged detail sectional view as seen on line 3—3 Fig. 1. Fig. 4 is a detail elevation of the sleeve or hub, to which the blades are attached, and, Fig. 5 is a detail sectional view showing the manner of shifting the axle to change the angles of the blades.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 indicates a frame, which may be constructed of any suitable material and in any preferred manner, but in the present instance, represents the basket of a flying machine or similar device.

The frame is provided with a bearing 2, through which extends a sleeve 3 and if preferred, bearing rollers 4 may be introduced between the bearing and the sleeve.

Extending longitudinally of the sleeve 3 is an axle 5, said axle being less in diameter than the diameter of the opening through the sleeve, so that the axle will not bear against the wall of the sleeve, bearing rollers 6 being entered in grooves 7 in the axle and engaging and traveling over the interior of the sleeve.

The axle is provided with cones 8, which are positioned adjacent the ends of the sleeve, while the ends of the sleeve are provided with races 9 to receive bearing balls 10, thus forming a ball bearing at each end of the sleeve.

Movably attached to the inner end of the sleeve 3 is a sprocket 11 and by means of which power may be applied to rotate the sleeve from any suitable form of motor or other device.

Adjacent the outer end of the sleeve 3 is provided a substantially globular hub 12, which is provided at diametrically opposite points with sockets 13 and 14, through which extend the stems 15 and 16 of blades 17 and 18, said stems being rotatably mounted in the sockets.

The inner ends of the sockets terminate in recesses 19 and 20, which recesses extend longitudinally of the sleeve and extend inwardly from one side of the hub, so that lock nuts 21 and 22 may be introduced on to the inner ends of the stems, thereby holding the stems in the sockets.

Between the inner ends of the sockets 13 and 14 and the nuts on the ends of the stems 15 and 16 are provided ball bearings 23 and 24 respectively, while similar ball bearings 25 and 26 are placed at the outer ends of the sockets.

Each of the stems immediately beyond the sockets is made square in cross section, as shown at 27 and 28, and mounted upon said squared portions are bevel gears 29 and 30, the outer faces of the gears being engaged with shoulders 31 and 32, which are prefer-

ably formed integral with the stems and by forming the openings through the bevel gears in contour similar to the squared portions of the stems, said steams will be caused to rotate with the gears.

The outer end of the axle 5 is also preferably formed square in cross section, as shown at 33 and placed upon said squared portion is a bevel gear 34, which bevel gear meshes with the two gears 29 and 30 and as said gear 34 normally remains stationary, while the gears 29 and 30 are moved in a circle around the axle, the stems and blades to which the gears 29 and 30 are attached will be caused to rotate while passing around the axle. The gear 34 is held in position on the axle 5 by threading the outer end of the axle and placing thereon nuts 35, a washer 36 being preferably positioned between the nuts and the face of the gear.

As there is considerable strain upon the stems of the blades when in operation, I provide a bevel disk 37, which is rotatably mounted upon the sleeve 3 and so positioned that the beveled edge thereof will approximately engage the beveled edges of the gears 29 and 30, the disk being held in position on the sleeve in any suitable manner, as by means of brackets 38, which are extended outwardly from the frame 1 and if desired, roller bearings 39 may be placed between the disk and the sleeve to reduce friction therebetween. By this construction, it will be readily seen that the stems of the blades will be securely braced and the gears 29 will be positively held in engagement with the gear 34 at the outer end of the axle.

The blade 18 is so timed as to direct its force against the wind when said blade is pointing downwardly or when directly below the axle, while the blade 17 is likewise so timed as to be feathered or turned edgewise to the wind, when the lower blade is directing its force against the wind and vice versa when the two blades have changed positions. If, however, it is desired to cause the blades to impart a lifting movement to the objects carrying the same or to lower the object, the angles of the blades are so arranged as to direct the force of the blades against the air previous to or slightly after the blades have reached the positions previously described. This is accomplished by attaching a lever 40 to the axle 5 and by rotating said axle, the gear 34 will be rotated and the angles of the blades changed accordingly.

The axle is held in its adjusted position in any preferred manner, as by providing a rack bar 41, with which coöperates a latch 42 carried by the lever.

The gears employed for rotating the blades are so arranged that the blades will be given one complete revolution while traveling once around the axle and by arranging said blades so as to extend at right angles to each other at all times, the full resistance of the blades against the wind will only occur when the blade is turned to one particular point and will be positioned at such an angle during the remainder of the revolution as to present but slight resistance.

It will further be seen that although I have shown and described the blades as applied to use in connection with the frame of a flying machine, said blades can be applied to any device, which is to be propelled or operated by the force of the blades against the wind and it will likewise be seen that the angle of the blades can be quickly changed to impart a lifting or lowering action upon the blades.

What I claim is:—

1. A propeller comprising a frame, an axle, a sleeve rotatably mounted in the frame and surrounding the axle, a pair of blades rotatably mounted on the sleeve at right angles thereto, a bevel gear fixed on the axle, a bevel gear fixed on each blade and meshing with the axle gear, a smooth bevel disk rotatably mounted on the sleeve adapted to engage the faces of the teeth of the gears on the blades, means for maintaining the position of the disk on the axle with relation to the gears on the blades, and means for rotating the sleeve.

2. A propeller comprising a frame, an axle, a sleeve rotatably mounted in the frame and surrounding the axle, a pair of blades rotatably mounted on the sleeve at right angles thereto, a bevel gear fixed on the axle, a bevel gear fixed on each blade and meshing with the axle gear, a smooth bevel disk rotatably mounted on the sleeve adapted to engage the faces of the teeth of the gears on the blades, brackets secured upon the frame and bearing on the face of the disk for maintaining the position of the disk on the axle with relation to the gears on the blades, and means for rotating the sleeve.

3. A propeller comprising a frame, an axle, a sleeve rotatably mounted in the frame and surrounding the axle, a substantially spherical hub secured upon the sleeve having two diametrically located recesses opposite each other and transverse angular recesses communicating with the inner portions of the diametric recesses, stems secured to blades and rotatably mounted in the diametric recesses, lock nuts on the inner ends of the stems located in the transverse recesses, bevel gears on the blade stems, a bevel gear on the axle meshing therewith, and means for rotating the sleeve.

4. A propeller comprising a frame, a normally stationary axle, a sleeve rotatably mounted in the frame and surrounding the axle, blades carried by the sleeve at right

angles thereto and rotatable on their longitudinal axes, a bevel gear carried by each blade, a bevel gear on the shaft meshing therewith, a bracket on the frame comprising a curved rack concentric with the axle, a lever secured to the axle, and a latch on the lever engaging the teeth of the rack.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DAVID CROCKETT.

Witnesses:
C. S. FRYE,
C. E. FETZER.