W. MORGAN.

COLLAPSIBLE PROPELLER MECHANISM.

APPLICATION FILED JAN. 14, 1909.

931,456. Patented Aug. 17, 1909.

Fig. 1.

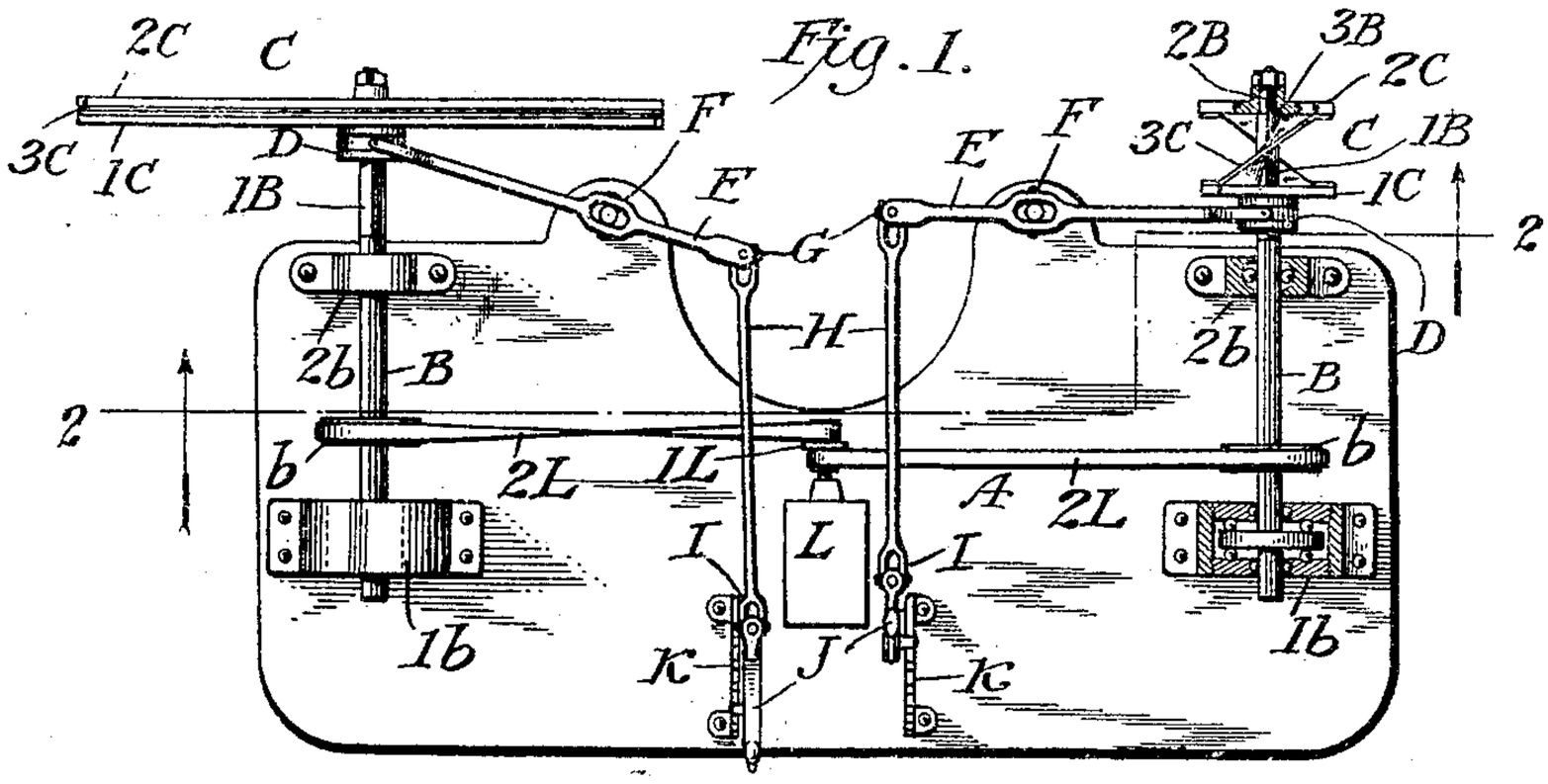


Fig. 2.

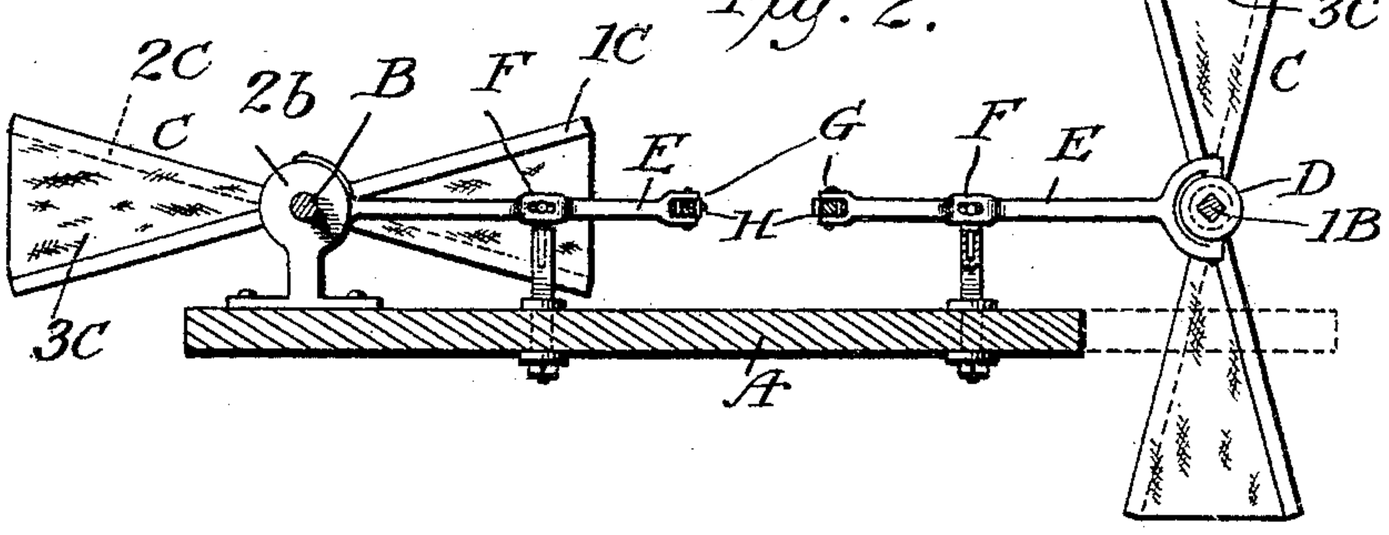
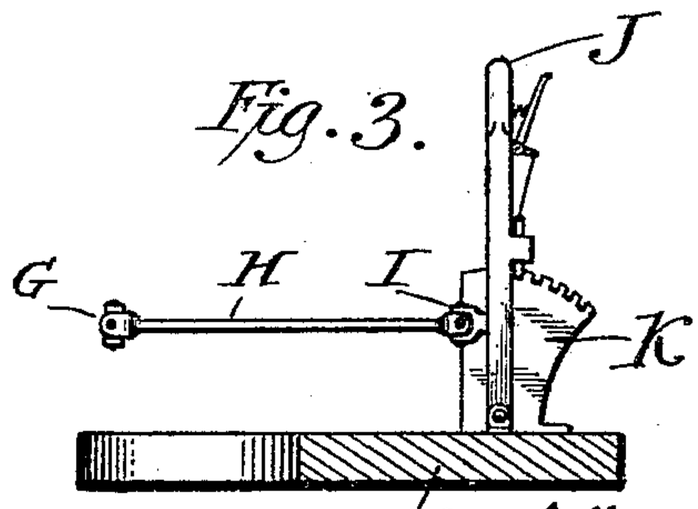


Fig. 3.



WITNESSES

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COLLAPSIBLE PROPELLER MECHANISM.

No. 931,456. Specification of Letters Patent. Patented Aug. 17, 1909.

Application filed January 14, 1909. Serial No. 472,325.

To all whom it may concern:

Be it known that I, WILLIAM MORGAN, a subject of the King of Great Britain, residing at Fort Plain, in the county of Montgomery and State of New York, have invented certain new and useful Improvements in Collapsible Propeller Mechanism, of which the following is a specification.

My invention in collapsible propeller mechanism relates to a propeller device applicable chiefly to aeronautical machines, such as aerodromes, airships, ice-boats and the like. It has particular reference to propellers of that class which are constructed of flexible material secured to a rigid frame and extend thereby, and the object of my invention is first to provide a system of propellers of this class which may be more readily controlled than those at present in vogue as far as I am aware, and second to provide a controlling means therefor in a more effective, simple and expeditious manner, and at the same time provide a system more readily within the control of the operator than with any of those methods or appliances at present in vogue for accomplishing the same purpose within the purview of my knowledge. I attain these objects by the instrumentalities and mechanism illustrated in the drawings hereto attached, which form part of this specification when taken with the descriptive matter relative thereto.

With reference to the drawings, Figure 1 is a top plan view of my improved collapsible propeller mechanism involving two propellers adapted to rotate in opposite directions, illustrating one of the said propellers extended, and the other collapsed, and Fig. 2 is a vertical, sectional elevational view of the same taken on the line 2—2 of Fig. 1, in a direction indicated by the arrows in Fig. 1. Fig. 3 is a fragmentary detailed, side elevational view of one of the controlling levers and connecting bar, and a section of the platform or table carrying the same, in accordance with my invention.

In the several figures, similar characters of reference designate like parts, wherein

A indicates the platform or table of the device upon which is mounted the laterally disposed parallel propeller shafts B. These are supported in bearings by the table or platform A, and are mounted upon the standards or bearing supports 1^b and 2^b. Each of the propeller shafts B are squared at 1^B toward their outer extremities to slidingly fit a hub and swiveling collar mounted upon each. Each of the shafts B carry at their outer extremities respectively a right handed and left handed screw propeller C. These embrace the relatively movable arms 1^c and the relatively fixed arms 2^c, the latter are secured to the terminals of their respective shafts B by a tapering squared portion 2^B of smaller diameter than the squared portion 1^B and concentric therewith, engaging a corresponding bore intermediately in their respective arms 2^c, and are jammed against the shoulder 3^B, resulting at the junction of the smaller squared portion 2^B and the larger squared portion 1^B by means of a screw and nut connection.

3^c indicate the propeller blades which I prefer to construct of a tough grade of sail cloth or other similar material made impervious by varnishing in a well known manner with linseed oil or other suitable material of this character. These have a sector formation as depicted in Fig. 2 and are secured at their opposite marginal edges by lacing, tacking or other well known securing means to the relatively movable arms 1^c and the fixed arms 2^c. The relatively movable or sliding arms 1^c are secured to their respective hubs D and are adapted to extend their respective blades 3^c by moving them inwardly by the hubs D on the squared portions 1^B of the shaft B.

A sliding movement on the shafts B is imparted to the hubs D through their swiveling collars, in the extension of the propellers C, by forked levers E of the first order, having their outer forked terminals engaging the swiveling collars of each of the hubs D of the propellers C. These are universally jointed to and carried by the standards F and the free terminals of the levers E are provided with universally joined connections G to engage a pair of pull levers H swiveled thereto by said joints. The free terminals of the pull levers H engage universal joints I and are secured thereto by a pair of swinging controlling levers J which are latched to notched quadrants K, carried by, and secured to the base A in a well known manner.

L designates a motor provided with a pair of driving pulleys separated by a flange 1^L, and the propeller shafts B are provided each with a tight pulley *b*. These are connected with the power shaft of the motor L and the pulleys thereon by means of belts 2^L, adapted

to rotate the propeller shafts B in opposite directions as will be understood by the illustration Fig. 1.

In the operation of my improved collapsible propeller mechanism as just described, let it be assumed that the engine L will be set into rotation and the propeller shafts B are being rotated in opposite directions by the reverse and direct drive belts 2^L, and that it is desirous of rendering one of the propellers inactive. For example, the one to the left in the drawing. Upon unlatching and pulling the left lever J rearwardly, the movement will be transmitted to the left propeller C through the unversal joint I, pull lever H, and universal joint connection G, when lever E will be swung upon its universal joint connection F, and the forked terminals of the said lever engaging the collar and hub D on the relatively movable arm 1^c of this propeller will assume the position as illustrated in Fig. 1, when the left propeller C will be closed.

It is obvious that with the propeller C in its condition of inactivity, the right propeller reacting against the atmosphere will tend to rotate the entire platform and mechanism when employed on an airship, aerodrome or the like serving as a rudder and upon the extension of the left propeller and the collapsing of the right propeller, the tendency of rotation would be in the opposite direction. Again it will be obvious that by collapsing both propellers in the manner aforesaid, the propelling effort of the device could be reduced to zero, and that all gradations in the propelling effort to a maximum may be obtained by extending the propellers within their range from a folded or collapsed position to full extension. It will be therefore understood by the foregoing that my invention provides a means for controlling air propellers for the varying of the speed of the vehicle vessel or device to which they are applied as a motive power apparatus and for steering the same as well, and I therefore do not desire to be limited in the precise details of construction embraced by my invention, since I have disclosed but one manner whereby the same may be executed by those skilled in the art to which the same relates. I am aware however that previous to my invention folding propellers have been in vogue and I do not therefore claim these broadly as my invention, but

I do claim as new and desire to secure by Letters Patent of the United States.

1. In a propeller mechanism of the character described a propeller having relatively a fixed member and a relatively movable and sliding member, a shaft carrying the two, said sliding member adjustable longitudinally thereon, means carried by and co-acting with the shaft for adjusting the relative position of the said two members on the said shaft and a flexible material connecting the two.

2. In a propeller mechanism of the character described, a propeller having a frame comprising a relatively fixed rigid member, and a relatively movable sliding member, a shaft carrying the two, said sliding member longitudinally adjustable thereon, means carried by and co-acting with the shaft for adjusting the relative position of the said two members on the said shaft and collapsible blades secured to each of the members of the said frame.

3. In a propeller mechanism of the character described, a propeller having a rigid frame, comprising a relatively fixed member and a movable member, a shaft carrying the two, the movable member slidingly adjustable thereon, means carried by and co-acting with the shaft for adjusting the position of the movable member, and flexible propeller blades interposed between and secured to each of the said members and adapted to be folded and extended therebetween.

4. In a propeller mechanism of the character described, a propeller having a rigid frame, comprising a relatively fixed member and a movable member disposed in angular relation thereto and in parallel planes, a shaft carrying the two and perpendicular to the axis thereof, the movable member slidingly adjustable thereon, a shifting mechanism carried by and co-acting with the shaft and the movable member for adjusting the position of the two, and imparting a relative parallel movement to the movable member, and flexible propeller blades interposed between and secured to each of the said members and adapted to be folded and extended therebetween.

5. In a propeller mechanism of the character described, a pair of oppositely rotatory propellers, provided with collapsible blades and rigid frames, a motive power apparatus co-acting therewith and adapted to rotate the same in opposite directions and a system of levers coacting with the rotatory propellers adapted to collapse the blades laterally to eliminate the pitch thereof by a movement imparted to the said levers and to extend the same by an opposite movement.

6. In a propeller mechanism of the character described, a pair of oppositely situated rotatory collapsible propellers provided with flexible blades and rigid arms therefor, propelling shafts carried by each, a motive power apparatus co-acting therewith and adapted to rotate the propellers in opposite directions and a system of levers, co-acting with the rotatory propellers and the said shafts, adapted to slidingly collapse the said flexible blades by a suitable movement being imparted to the said levers and adapted to extend the said blades by a reverse movement of the said levers.

7. In a propeller mechanism of the character described, a pair of oppositely situated rotatory collapsible propellers provided with flexible blades and rigid arms therefor, propelling shafts carried by each, a motive power apparatus co-acting therewith, and a transmission system connecting each of the propellers with the motive power apparatus and adapted to rotate the propellers in opposite directions and a system of levers for each co-acting independently with the rotatory propellers and the rigid arms thereof and adapted to slidingly collapse the flexible blades by a suitable movement being imparted to either of the said levers and to extend the said propellers by imparting a reverse movement to the levers, substantially as described.

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

WILLIAM MORGAN.

Witnesses:
LEONARD B. MOORE,
R. B. SAMMONS.