R. E. SMALL.

PROPELLING MECHANISM.

APPLICATION FILED DEC. 15, 1919.

1,381,939. Patented June 21, 1921.

Fig. 1.

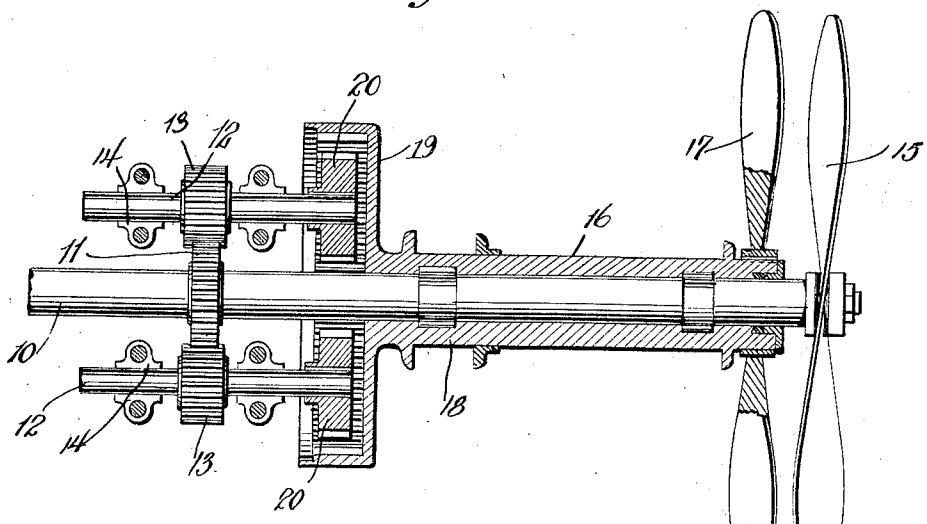


Fig. 2

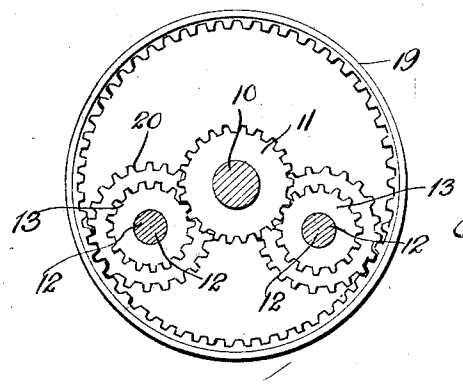
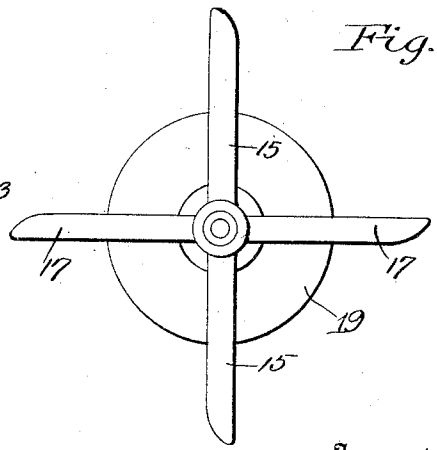


Fig. 3.



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PROPELLING MECHANISM.

1,381,939. Specification of Letters Patent. Patented June 21, 1921.

Application filed December 15, 1919. Serial No. 345,063.

To all whom it may concern:

Be it known that I, ROBERT E. SMALL, a citizen of the United States, residing at #32 Moyston St., Schenectady, in the county of Schenectady and State of New York, have invented certain new and useful Improvements in a Propelling Mechanism, of which the following is a specification.

My invention relates to improvements in propeller mechanisms and aims to provide means to eliminate "slip" in the propeller mechanism of a boat or aeroplane.

My invention consists more particularly in employing opposite rotating propeller devices and means to operate them; the purpose of the oppositely acting propellers being to eliminate the "slip" which is experienced when one propeller is acting alone and which usually nullifies the propelling power of the propeller 20 per cent.

Various other objects and advantages of my invention will become apparent during the continuance of the following description.

In the drawings:—

Figure 1 is a view in side elevation with parts in section showing the propellers and the mechanism to operate the same.

Fig. 2 is a view in cross-section showing the arrangement of gears which rotate the propellers in opposite directions.

Fig. 3 is a view in front elevation showing relation of the propellers.

In the drawings 10 designates the main or driving shaft which carries a driving pinion 11 from which movement is transmitted to the counter shafts 12 through the medium of other pinions 13 which are in co-meshing engagement therewith. The counter shafts 12 may be mounted in any suitable or desirable manner. However, the drawings have shown bearings 14 for this purpose.

At its rear end the main or driving shaft 10 carries a propeller 15 of conventional type which receives a direct drive from the shaft and which will therefore be hereinafter designated as the main propeller. If the device of my invention be used as mechanism for propelling boats it is, of course, understood that propeller 15 will be of a suitable and desirable type for that purpose. However, if the mechanism be used for other purposes, propellers of a different type may be employed for it if so desired.

A hollow shaft 16 rides on the main or driving shaft 10 between the pinion 11 and the propeller 15 and carries a propeller 17 at its rear end in opposed relation to the propeller 15 of the main shaft. The shaft 16 is independently rotatable with relation to the main or driving shaft 10 and may be equipped with suitable bearing surfaces and means such as indicated at 18 whereby it will be made to rotate freely with respect to its supporting means and at the same time maintain a water-tight connection therewith if such connection is desired. At its forward end the shaft 16 carries a crown gear 19 whose inwardly projecting teeth are in co-meshing engagement with pinions 20 of the counter shafts 12 at points on each side of the main or driving shaft 10. Consequently it will be seen that when the main or driving shaft 10 is rotated, while the main propeller 15 will be rotated in the same direction the counter shafts will be rotated in an opposite direction thus imparting rotation to the shaft 16 through the crown gear 19 and to the propeller 17 opposite to the direction of rotation of the main shaft 10 and the main propeller 15.

From the above it is believed that the advantages and novel features of my invention will be readily understood and therefore further detailed description is deemed unnecessary.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

A propelling means including a main shaft, a propeller member fixed to said shaft and adapted to rotate therewith, a driving gear on said main shaft, a hollow shaft receiving said main shaft, a propeller fixed to said hollow shaft and adapted to rotate therewith, means to prevent independent longitudinal movement of said shafts with respect to each other, countershafts, said countershafts being positioned in parallel relation to said driving shaft, pinions on said countershafts meshing with said driving gear, an inverted crown gear carried by said hollow shaft, other pinions on said countershafts meshing with said crown gear, and said main shaft being adapted to be driven substantially as described.

In testimony whereof I affix my signature.

ROBERT E. SMALL.