

No. 854,685.

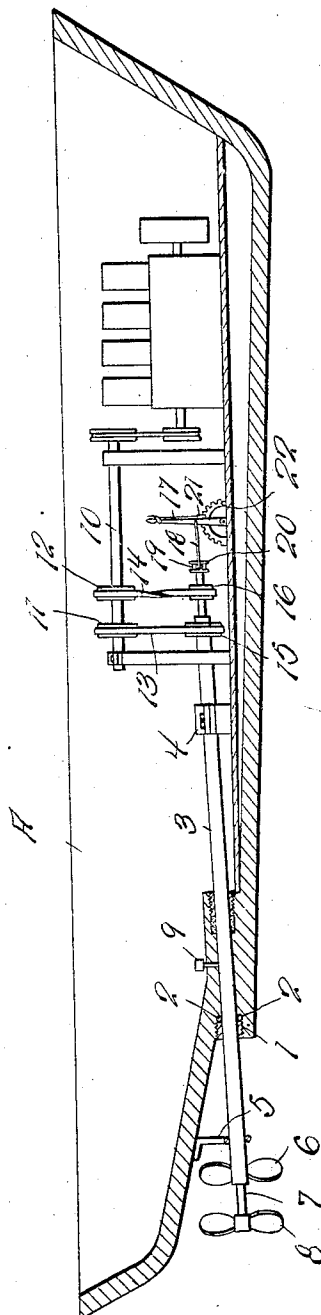
PATENTED MAY 21, 1907.

J. BERMES.  
PROPELLER.

APPLICATION FILED SEPT. 11, 1906.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

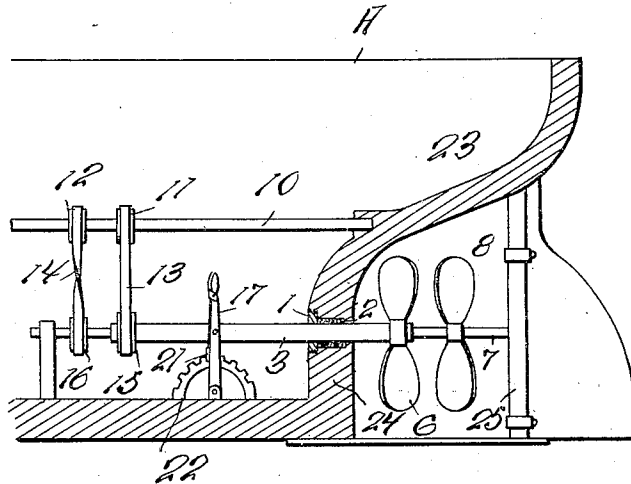
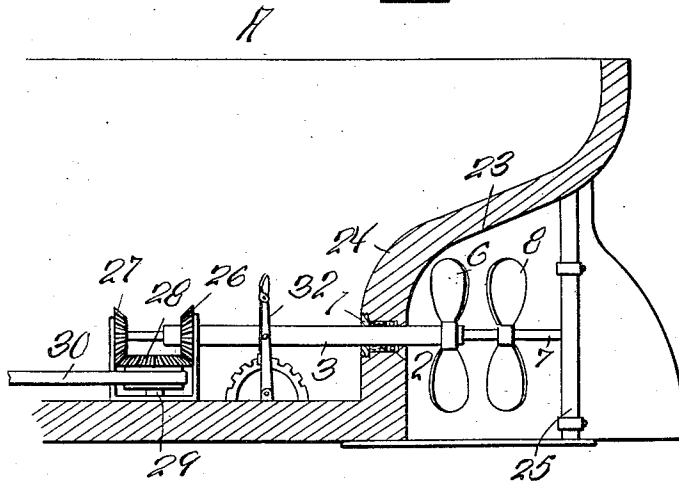


Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## PROPELLER.

No. 854,685.

Specification of Letters Patent.

Patented May 21, 1907.

Application filed September 11, 1906. Serial No. 334,167.

*To all whom it may concern:*

Be it known that I, JOHN BERMES, a citizen of the United States, residing at the town of Union, in the county of Hudson and State of New Jersey, have invented a new and useful Propeller; 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.

This invention relates to means for propelling vessels; the invention has for its object the attainment of greater speed than has been possible with means heretofore employed.

The invention has particular reference to screw-propellers, and it may be stated to consist in an improved arrangement of two propellers, one in advance of the other, and means whereby said propellers may be rotated in opposite directions, so that the volume of water set in motion by the first propeller shall impact against the second propeller which will thus operate to propel the vessel with which it is connected, at greatly accelerated speed.

The invention further consists in the improved construction and novel arrangement and combination of parts which will be hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention; it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the invention may be resorted to when desired.

In the drawings: Figure 1 is a sectional elevation of a boat or vessel equipped with propellers in accordance with the principles of the invention. Fig. 2 is a longitudinal sectional view of a portion of a vessel, illustrating a modification of the invention. Fig. 3 is a longitudinal sectional view illustrating another modification.

Corresponding parts in the several figures are denoted by like characters of reference.

The hull of the boat or vessel to which the invention is applied, as shown at A is preferably constructed on lines conducive to speed. In Fig. 1 the bottom of the boat is made to slope upwardly from the stem to the stern

and it is provided with an aperture for the passage of the shafts carrying the propellers. The aperture is provided with a gland 1 constituting a bearing in which antifriction balls or members 2, 2 are placed; the gland 1 constitutes a bearing for a tubular shaft 3, additional bearings for which, as 4, may be provided within the vessel; said tubular shaft is also shown as having an additional bearing in a hanger 5 beneath the stern of the vessel. The tubular shaft 3 carries at or near its rear end a screw-propeller 6 of suitable and approved construction.

Extending through the tubular shaft 3 and supported for rotation therein is a shaft 7 which extends a suitable distance in rear of the tubular shaft and which carries a screw-propeller 8 the blades of which are pitched in a reverse direction to the propeller on the tubular shaft 3. The latter is provided with suitable lubricator 9 for supplying lubrication to the shaft 7.

In Fig. 1 of the drawings has been shown a counter-shaft 10 which is adapted to be driven by power such as an engine or motor of any suitable construction. The counter-shaft carries pulleys 11, 12 from which motion is transmitted by belts or bands 13 and 14 to pulleys 15 and 16 upon the shafts 3 and 7 respectively, one of the bands 14 being twisted so that the shafts 3 and 7 will be rotated in opposite directions.

It will be readily seen that when the shafts carrying the propellers are rotated in the proper direction, the volume of water which is set in motion by the forward propeller 6 will impact against the blades of the rearward propeller 8, and furnish a resistance for the latter which is thus rendered extremely effective in assisting in the propulsion of the vessel which latter may thus be propelled at a speed which is largely in excess of that obtained when a single screw-propeller, or a plurality of propellers arranged side by side are employed.

It may be found desirable at times to regulate the distance between the propellers 6 and 8, according to the speed at which they are being rotated and other conditions; to this end the inner shaft 7 carrying the propeller 8 may be adjusted longitudinally within the shaft 3, as by means of a suitable hand lever 17 connected by a link 18 with a collar 19 fitted between flanges 20 upon the shaft 7;

the lever 17 being provided with a stop member 21 adapted to engage a rack 22 whereby the parts may be retained in position at various adjustments; by this simple arrangement the shaft 7 carrying the propeller 8 may be adjusted longitudinally so as to space the propeller 8 at various distances from the propeller 6 carried by the tubular shaft 3. When this construction is adopted, the shaft 7 will be feathered in or otherwise slidably connected with the pulley 16.

Under the construction illustrated in Figs. 2 and 3 of the drawings, the hull of the vessel is provided at its rear end with a recess or offset 23 to accommodate the propellers. The gland which constitutes the antifriction bearing for the tubular shaft 3 is here supported in the stern-post 24 and an auxiliary bearing for the rear end of the shaft 7 is formed in the rudder-post 25. In Fig. 3 of the drawings a somewhat modified means for driving the shafts 3 and 7 has been shown, said shafts being provided with bevel gears 26, 27 meshing an intermediate bevel pinion 28 mounted upon a shaft 29 which is supported for rotation in suitable bearings and which is driven from any suitable source of power as by means of a belt 30. Under the construction shown in Figs. 2 and 3 it would not be convenient to have a longitudinal adjustment of the shaft 7 owing to the fact that the latter has a bearing in the rudder-post; in said figures the outer tubular shaft 3 carrying the propeller 6 has been illustrated as being longitudinally adjustable by means of a hand lever 32 for the purpose of regulating the distance between the propellers.

The operation and advantages of this invention will be readily understood, from the foregoing description taken in connection with the drawings hereto annexed, by those skilled in the art to which it appertains.

The invention is applicable to motor boats, despatch boats and all classes of vessels where the attainment of higher speed is desirable; the invention may in like manner be applied to the propulsion of torpedoes and to other similar uses. When the two propellers are rotated in opposite directions, as herein described, the volume of water set in motion by the forward propeller will impinge or impact upon the blades of the rearward propeller which is thereby rendered extremely effective, as will be easily understood; the efficiency of the forward propeller is also augmented, owing to the fact that the escape in a rearward direction of a body of water set in motion thereby is checked by the rearward propeller, and a very high speed may thus be attained.

The invention is capable of being success-

fully applied without necessarily providing for the relative adjustment of the propellers; but when the propellers are made adjustable as herein described, they may be disposed with relation to each other in such a manner that the most satisfactory results may be attained under all conditions arising from the speed at which the propellers are rotated, it having been found that when the speed of rotation is low, better results are obtained by placing the propellers close together while, when the speed is high, it will be found better to space the propellers farther apart.

No limitation is made to any particular manner of operating the propellers.

The invention may be applied to vessels at a cost not greatly exceeding that of the ordinary single propeller.

Having thus described the invention what is claimed is:

1. Means for propelling vessels, comprising a pair of shafts, one being rotatably and telescopically mounted within the other, propellers carried by said shafts, one of said propellers having its blades pitched oppositely to the blades of the other propeller, means for adjusting one of said shafts telescopically within the other, comprising a rack, a lever and a hand-operated pawl to co-operate with said rack, said adjustable shaft having flanges at its ends, a collar rotatably mounted between said flanges and a link having one end pivotally connected to said lever while its other end is pivoted to said collar and a motor belted to said shafts for rotating the same.

2. Means for propelling vessels comprising a pair of shafts, one being hollow and the other mounted rotatably and telescopically within the hollow shaft, a ball bearing gland and lubricant device for the hollow shaft, propellers carried by said shafts, one of said propellers having its blades pitched oppositely to the blades of the other propeller, means for adjusting one of said shafts telescopically within the other, comprising a rack, a lever and a hand-operated pawl to co-operate with said rack, said adjustable shaft having flanges at its ends, a collar rotatably mounted between said flanges and a link having one end pivotally connected to said lever while its other end is pivoted to said collar and a motor belted to said shafts for rotating the same.

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

JOHN BERMES.

Witnesses:

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