J. H. ESSON.

PROPELLER.

APPLICATION FILED JULY 8, 1912.

1,055,455. Patented Mar. 11, 1913.

Fig.1.

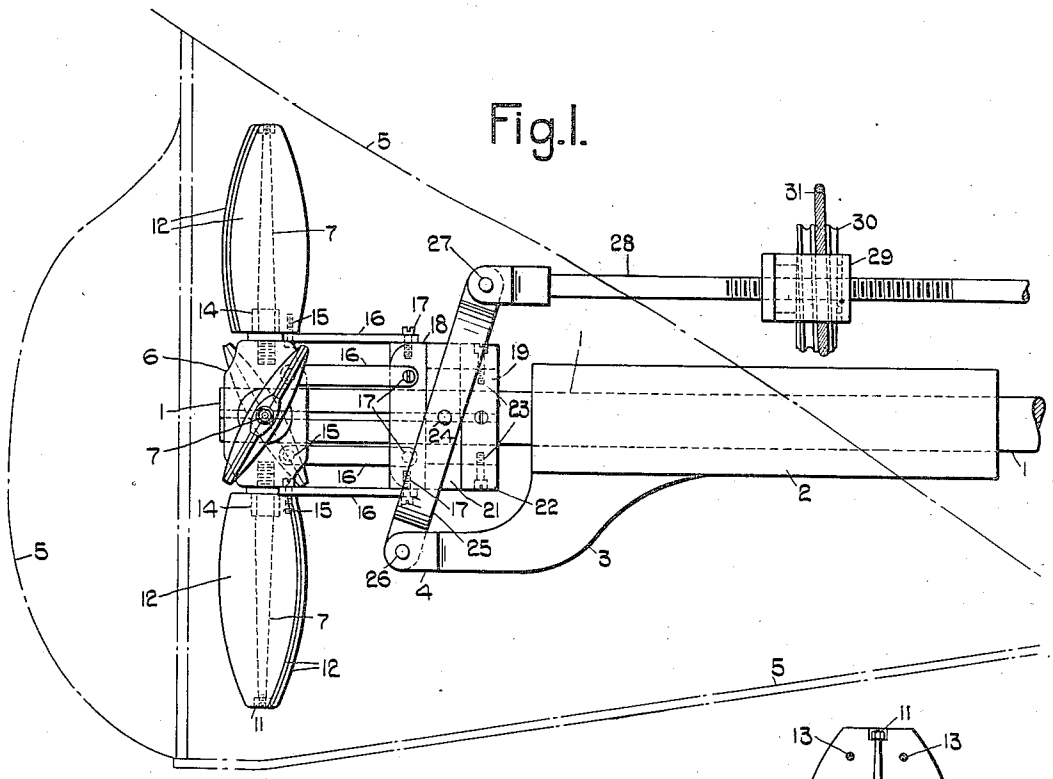


Fig.3.

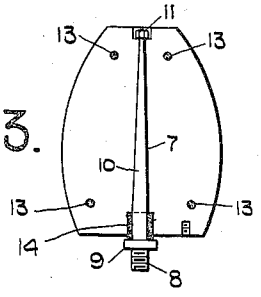
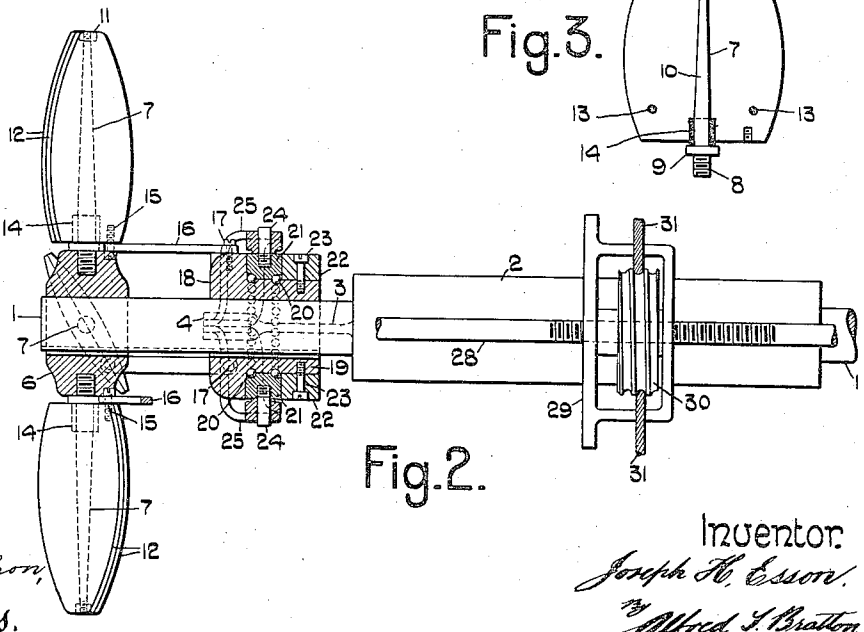


Fig.2.



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UNITED STATES PATENT OFFICE.

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PROPELLER.

1,055,455. Specification of Letters Patent. Patented Mar. 11, 1913.

Application filed July 8, 1912. Serial No. 708,234.

To all whom it may concern:

Be it known that I, JOSEPH HAMILTON ESSON, a citizen of the Dominion of Canada, residing at 165 King street west, in the city of Hamilton, in the county of Wentworth, in the Province of Ontario, Dominion of Canada, have invented certain new and useful Improvements in Propellers, of which the following is a specification.

This invention relates to propellers adapted to serve for the purpose of propulsion in water or for aerial navigation or power production.

The invention has more particular reference to that type of propeller provided with means for varying the angle of the blades with respect to the axis of rotation whereby the speed of movement or propulsion may be readily controlled—or the direction reversed—without the necessity of speed-changing or reversing gear.

The main object of my invention is to provide a novel form of propeller which may be readily reversed or the position of the blades adjusted in order to alter the direction of travel, or to increase or decrease the speed.

A further object of my invention is to provide a propeller of the nature specified which can be easily and conveniently adjusted to regulate the pitch of the blades to obtain the maximum of efficiency with the consequent utilization of the full propulsive or driving power produced or applied respectively.

A still further object of my invention is to provide a propeller which shall be simple, strong, and durable in construction, efficient in operation, and which shall permit a blade to be readily removed and replaced when required.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and more particularly pointed out in the appended claim.

In the accompanying drawings, Figure 1, is a longitudinal elevation of a screw-propeller for launches constructed in accordance with my invention. Fig. 2, is a part sectional plan of the same; and, Fig. 3, is a detail of part of one of the propeller blades and hereinafter more specifically referred to.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

According to the form of my invention illustrated, the main or tail shaft 1, is carried out through the stern of the boat and appropriately journaled in a stern tube 2.

This stern tube 2, is provided with a suitable watertight packing gland—not shown—and a depending web or arm 3, bifurcated at its rear end 4, for the purpose hereinafter explained. The tail shaft 1, extends lengthwise of the boat and is rotated by the engine or motor in the usual and well known manner.

5, indicates in dot and dash lines part of the stern and rudder of the boat.

Securely fixed on the outer end of the tail shaft 1, is the head-block or boss 6, of the propeller, and in the form of my invention shown, said boss 6, has firmly screwed thereinto four radially projecting rods or bars 7, 7, arranged at right angles to one another. These rods or bars 7, 7, are each preferably formed as shown most clearly in Fig. 3,—that is to say—with a threaded shank 8, for firm insertion into correspondingly screwed holes provided for the purpose in the aforesaid boss 6, a collar 9, and a gradually tapering shank 10, on which the compound blades are firmly clamped by an axial end screw or cap-nut 11. Each propeller blade consists of two reversely opposed portions 12, 12, which are adapted when placed in position face to face to break joint axially of the aforesaid rods 7, 7, and to this end each said portion is longitudinally grooved or fashioned with a semicircular tapered groove arranged to snugly fit the correspondingly tapered parts 10, 10, of the rods 7, 7. Screw threaded studs or rivets 13, 13, are employed for securely fixing the two halves of each blade 12, firmly together, and in order that the degree of frictional contact of each blade on its supporting or pivotal rod 7, may be accurately adjusted I may pack the lower end of each blade adjacent the collar 9, with a compressible packing ring 14. The blades 12,

12, as will be apparent, are pivotally clamped on the rods 7, 7, by the cap nuts 11, above referred to.

Pivotally connected to each propeller blade at 15, is a link 16, extending more or less axially of the tail shaft 1, the inner end whereof is similarly connected at 17, to a slidable boss or sleeve 18, feathered on the aforesaid shaft 1. This slidable sleeve 18, is preferably formed with a reduced part 19, grooved to receive balls or any other appropriate anti-friction media 20, 20, which support a collar 21, that is kept *in situ* by a clamping ring 22, appropriately fixed rigidly to said reduced portion 19, by set screws 23, 23.

On the collar 21, I suitably pivot by pintles 24, 24, a yoke 25, which is hingedly connected at 26, to the aforesaid depending arm 3, and at its upper part it is similarly articulated at 27, to the bifurcated end of a rod 28. This rod 28, extends longitudinally of the boat or launch and is suitably mounted in appropriate water-tight bearings—not shown—and it also passes through a box-bearing 29, which houses a wormed wheel 30, adapted for rotation by means of a cable or chain 31, carried forward to a steering-wheel or the like adjacent the engineer's station in the well known way. As this part of my device is in accordance with well known means for handling the rudder or helm I lay no claim broadly thereto, neither have I deemed it necessary to fully illustrate same, such being evident to and fully comprehended by those skilled in the art to which my invention appertains.

The wheel 30, is conveniently threaded on to a correspondingly screwed portion 32, of the aforesaid rod 28, and the box bearing 29, is preferably secured rigidly to the stern of the boat or launch. Thus it will be seen that by manipulating the wheel 30, in one direction the blades 12, 12, may be feathered to increase the speed of the boat or launch as well as the direction of travel thereof, whereas by a simple movement in a reverse direction the speed may be instantly changed, reversed, or brought to a neutral or non-effective position without changing the speed or reversing the direction of the engine or engines.

From the foregoing description and drawings it will be readily seen that while I have specifically described my invention in connection with a boat or launch, its uses for purposes of aerial navigation will be self evident seeing that the blades may be readily adjusted at will for the purpose of increasing or decreasing speed, or elevating, steadying or descending purposes, and that such manipulation can be accomplished without varying the speed of the engine or motor during its normal operation.

A further advantage accruing to my invention resides in the method of frictionally mounting the blades on the rods 7, 7, whereby any slip in either direction when changing their position is eliminated and a steady drive positively insured no matter what the speed or direction of rotation may be.

While the propeller above described is primarily designed for use in connection with an engine or other similar prime mover or source of power, it is evident that it may be equally well applied to wind-mills and the like by reducing the frictional contact of the blades 12, 12, on their supporting rods or axis.

With a propeller constructed as above described the operation of governing speed within certain limits is rendered automatic, as the governing effect prevents in a similar degree the raising of the speed of rotation of the propeller and the engine connected therewith beyond a desired limit and thereby eliminates the need for intricate, cumbersome, and weighty controlling devices. At the same time, by means of the manual control the speed of the propeller may be varied at will.

It will also be readily understood that while I have described one specific embodiment of my invention various changes in the form, proportions, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention. For example, the rods 7, 7, need not be extended the full length of the blades but be extended only into the thicker part thereof.

Having thus described my invention, what I claim as new, is:—

In a device of the character described, the combination with a boss, of a plurality of radially disposed tapered arms projecting from said boss and each of which comprises a threaded inner end and a body portion and a collar therebetween, two part blades, means for clamping said blades about said arms and a compressible packing ring embracing each of said arms adjacent its collar and embraced by the parts of said blades substantially as shown and described.

Signed at Hamilton, Ontario, Canada, this 3rd day of July, A. D. 1912.

JOSEPH H. ESSON.

In the presence of—

ALFRED T. BRATTON,
GERTIE NICHOLSON.