May 19, 1925. 1,538,802

B. G. HARLEY

PROPELLER FOR BOATS

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Fig. 1.

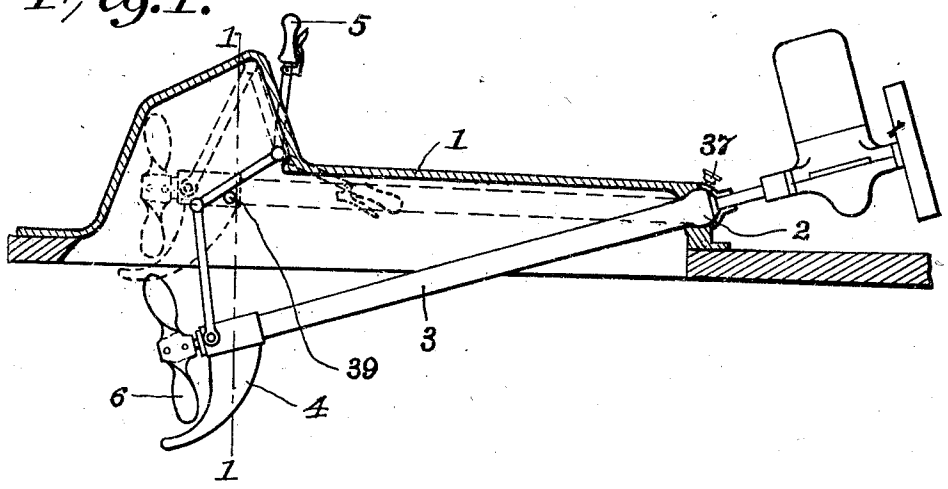


Fig. 2.

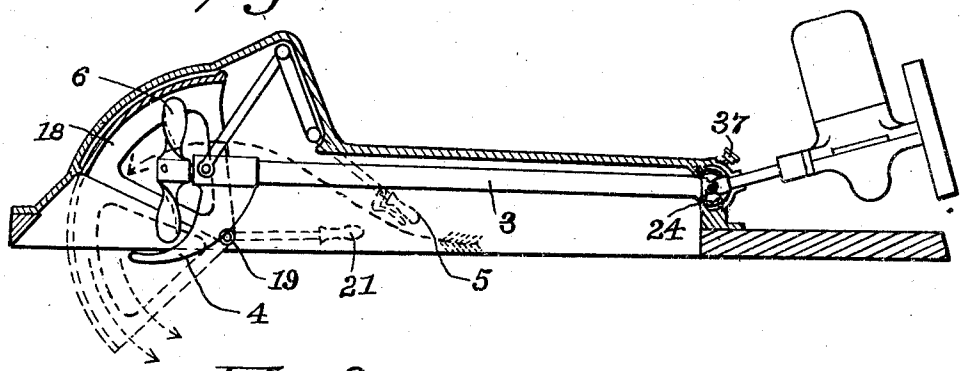
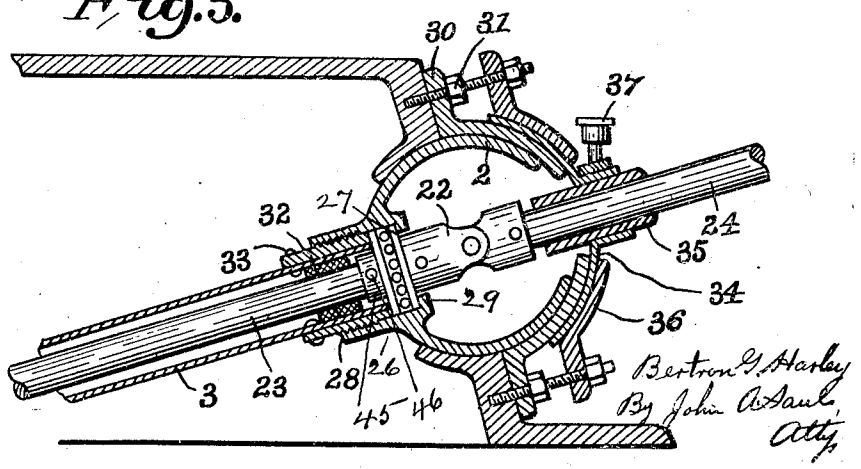


Fig. 3.



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Fig. 4.

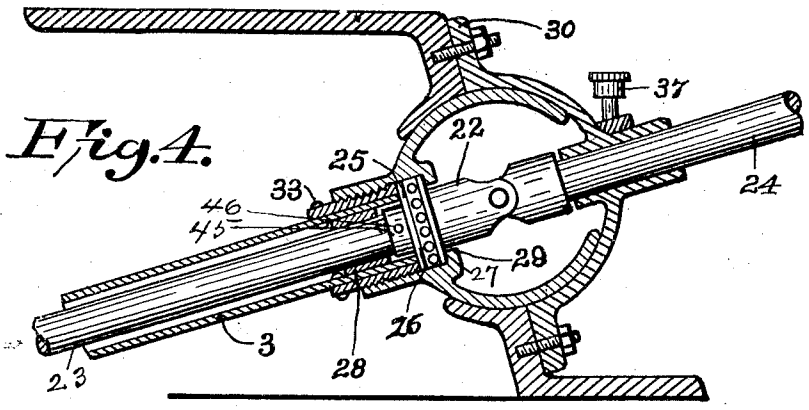


Fig. 5.

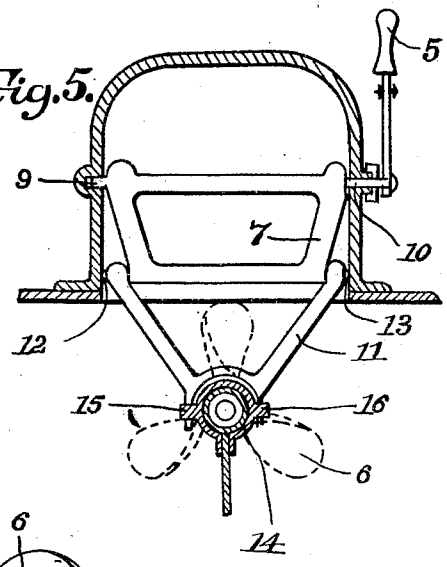


Fig. 6.

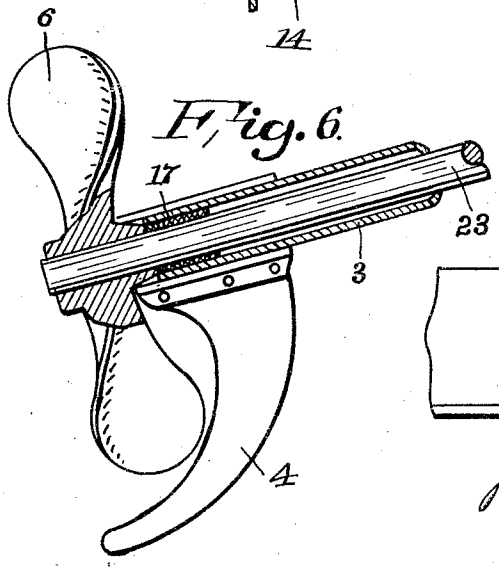
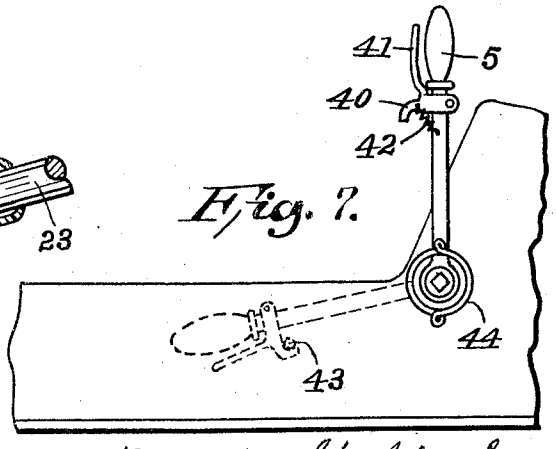


Fig. 7.



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Patented May 19, 1925. 1,538,802

UNITED STATES PATENT OFFICE.

BERTRON G. HARLEY, OF WIDEWATER, VIRGINIA, ASSIGNOR TO ALBERT L. ELLSWORTH, OF TORONTO, CANADA.

PROPELLER FOR BOATS.

Application filed May 19, 1922. Serial No. 562,130.

To all whom it may concern:

Be it known that I, BERTRON G. HARLEY, a citizen of the United States, residing at Widewater, in the county of Stafford and State of Virginia, have invented certain new and useful Improvements in Propellers for Boats, of which the following is a specification.

This invention relates to propellers of the type which may be raised above the keel level into a housing which is open on the underside and the principal feature of the invention consists in the novel construction and arrangement of parts, whereby the propeller shaft and its bearings are effectively protected from harmful effects of contact with the water by being enclosed within a tubular casing, which tubular casing is provided with a pivot whose axis corresponds with the pivotal axis of the flexible propeller shaft.

The principal objects of the invention are to produce a device which will be maintained in operative condition without attention and to so construct the same that it will be simple, durable, easily manufactured, and may be manipulated with ease and effectiveness.

In the drawings forming a part of this specification, and in which like symbols of reference represent corresponding parts in the several views:—

Figure 1 is a longitudinal section of the device, with the propeller in the lowered position;

Figure 2 is a similar view to Figure 1, showing the propeller raised;

Figure 3 is a longitudinal section of the universal joint and its housing;

Figure 4 is a view showing a modification of Figure 3;

Figure 5 shows a cross-section of the propeller housing, taken through the line 1—1, Figure 1;

Figure 6 is a sectional detail view of the rear end of the propeller tube; and,

Figure 7 is an elevational view illustrating the lever arrangement for manipulating the propeller tube.

In the drawings, 1 represents the housing of the propeller which is in the form of a metal casing open at the underside and is secured to the bottom of the boat. At the forward end this casing is provided with a part spherical cup in which is pivotally supported the spherical casing 2 which supports the shaft tube 3. At the rear end of the shaft tube 3 is secured a sleeve 14 which is provided with a downwardly and rearwardly turned skeg 4. This skeg protects the propeller 6 from injury through accidental contact with the ground or any obstructing object.

The member 14 is provided with transversely extending studs 15 and 16 upon which is pivotally mounted a yoke shaped member 11, the upwardly extending arms of which extend close to the sides of the housing 1 and are pivotally connected to the upper strut member 7 which is of a substantially rectangular form and is provided with pivot extensions 9 and 10 which are carried in journals in the side walls of the housing 1.

The pivot 10 projects through the side of the housing and is packed with a suitable packing nut or gland 8 and a control lever 5 is secured to the pivot to enable the link strut members to be operated to raise and lower the propeller tube.

The propeller shaft 23 is connected with the engine shaft 24 by a universal joint 22, the axis of which is arranged to coincide with the axis of the ball joint of the tube 3 so that the shaft and tube will remain in constant co-operating relation.

25 is a thrust bearing to take the propeller thrust before it is required to pass into the universal joint. The drawing shows a ball bearing form having hardened disks 26, 27 on either side of the bearing. The collar 28 is secured to the shaft 23 and passes the shaft thrust to the disk 27, which is held in place by a shoulder 29 of the ball joint, thereby passing the propeller thrust to the ball cap 30, held adjusted by the nut 31. A bearing 32 supports the propeller shaft within the tube 3. 33 are rivets connecting the shaft tube to the ball joint. 34 is a second ball or swivel joint which carries a shaft bearing 35, which swivels between the two ball caps 30 and 36, after the engine has been set. 37 is a grease cup through which grease is supplied to the interior of the ball joint, lubricating the various parts and flowing down the shaft to the propeller end.

In Figure 4 I have shown a construction similar to Figure 3, except that the ball cap 30 carries the engine shaft bearing.

This form is for use on smaller boats to cheapen the construction, and where it is not necessary to alter the line of the engine shaft. 39 is a stop attached to the housing to prevent the propeller from being lowered too far. The lever 5 is secured to the shaft or pivot of strut 7, and carries a locking device or catch 40 controlled by a lever 41 and spring 42 and is adapted to engage the pin 43 secured in the side of the housing 1. A spring 44 is arranged with one end secured to the housing. A spring 44, one end of which is attached to the lever and the other to the housing, is for the purpose of aiding the propeller to operate to lower automatically following the raising of same through contact with an obstruction. 45 is a collar and 46 a rivet to hold it to the shaft, said collar holding the propeller shaft in its proper relation to the thrust bearing.

In the operation of this device the propeller shaft is in constant operation during the operation of the engine and when it is desired to retain the boat at rest the lever 5 is depressed to lift upwardly on the strut members 7 and 11 to raise the propeller tube to the position illustrated in Figure 2 when the propeller simply idles.

When it is desired to have the boat move forward the lever 5 is swung upwardly depressing the propeller to any desirable point, the speed of propulsion of the boat being regulated according to the depth the propeller is projected below the bottom of the hull.

The propeller is supported in its bearing in the tube 3, which tube is rigidly supported by the strut members 7 and 11 and the bearings of the propeller shaft are maintained constantly lubricated by being immersed in the lubricant within the tube. This ensures the proper maintenance of lubrication at all vital points and further prevents detrimental action of the water on the steel propeller shaft.

Having now fully described my invention, what I claim is new, and desire to secure by Letters-Patent, is:—

1. In a propeller device for boats, the combination with the propeller shaft and propeller and a housing for the same, of a tube pivotally supported at one end enclosing the shaft, and having journal bearings at either end, a strut pivoted in the propeller housing, a strut pivoted at one end to the aforesaid strut and at the other end to the free end of said tube, and a lever for operating the struts arranged outside said housing and extending therethrough and rigidly connected to the strut pivoted in the housing.

2. In a boat propeller, the combination with a housing having an opening in the bottom to receive the propeller, of a propeller shaft pivotally supported at its forward end, a bearing for the rear end of the propeller shaft held in fixed relation to the propeller, a strut pivoted to said fixed bearing, a strut pivoted at one end to the aforesaid strut and at the other end in said housing, and means outside said housing for operating said struts.

3. In a boat propeller, the combination with a housing having an opening in the bottom to receive the propeller, of a propeller shaft pivotally supported at its forward end, a bearing for the rear end of the propeller shaft held in fixed relation to the propeller, a skeg rigid with said fixed bearing, a strut pivoted at one end to said fixed bearing, a strut pivoted to the aforesaid strut and pivotally supported in the housing, and a lever outside the housing for operating said struts.

In testimony whereof I affix my signature.

BERTRON G. HARLEY.