June 15, 1937. L. P. BAUMANN ET AL 2,083,771

PROPELLER UNIT

Filed Nov. 5, 1934 2 Sheets-Sheet 1

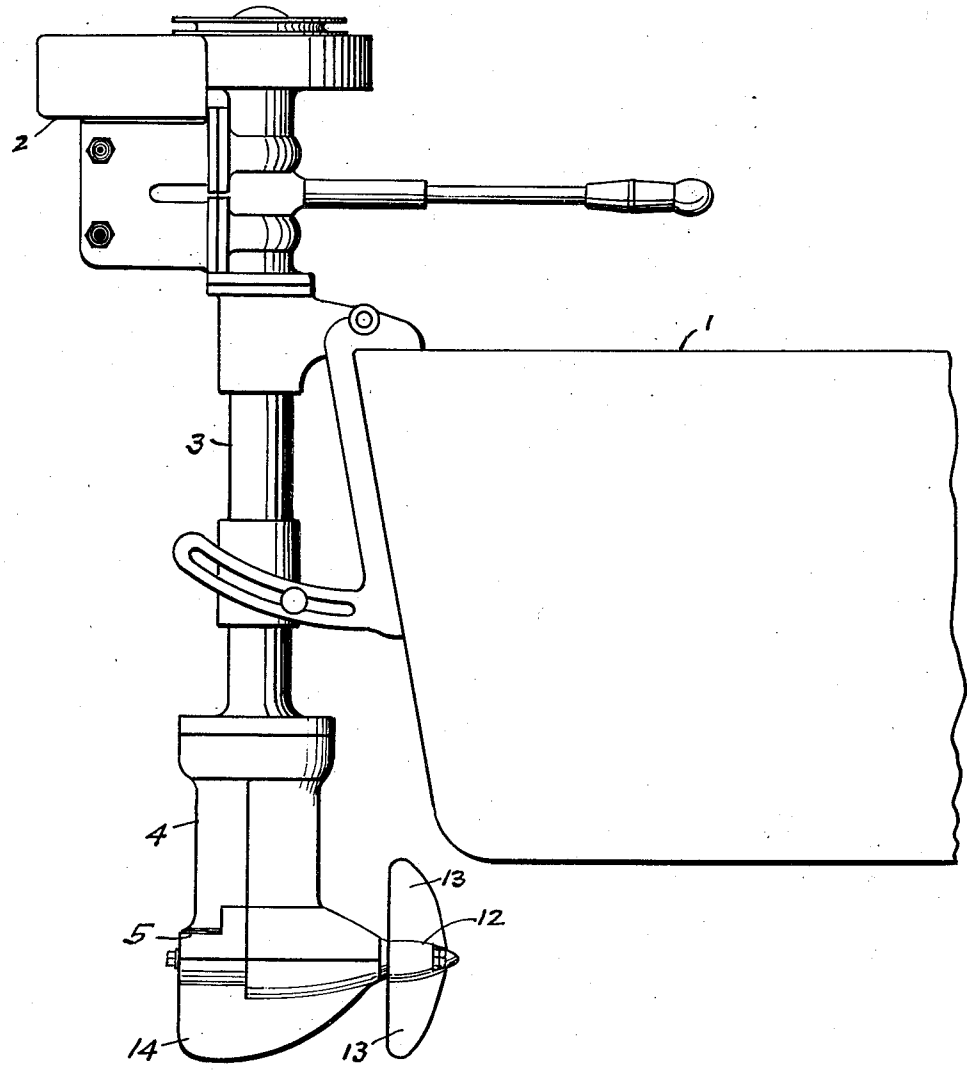


Fig. 1.

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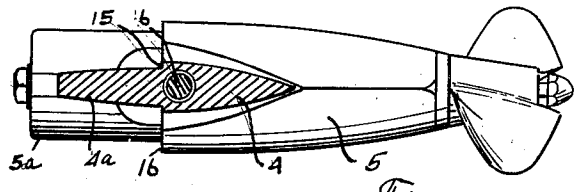


Fig. 4.

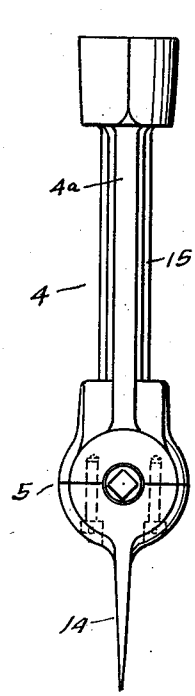


Fig. 2.

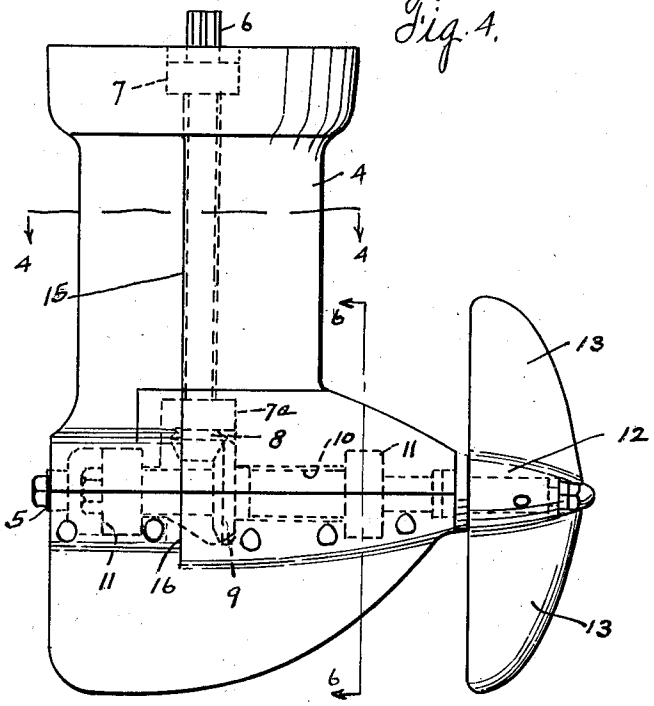


Fig. 3.

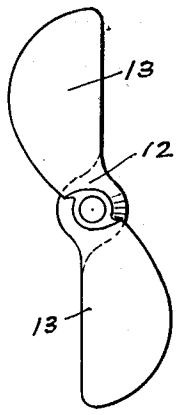


Fig. 5.

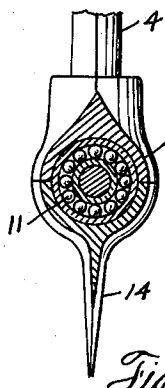


Fig. 6.

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Patented June 15, 1937 2,083,771

UNITED STATES PATENT OFFICE

2,083,771

PROPELLER UNIT

Louis P. Baumann and Lesley L. Walker,
Houston, Tex.

Application November 5, 1934, Serial No. 751,565

1 Claim. (Cl. 115—17)

This invention relates to a propeller unit for out-board motors, and has particular relation to the lower unit carrying the propeller on out-board motors designed for use on water craft.

An object of the invention is to provide in an out-board motor unit a novel type and a novel arrangement of the propeller.

Another object of the invention is to provide a novel type of gear case.

A further object of the invention is to provide a propeller arranged in front of the lower unit to the end that the propeller will work in quiet water in front of the gear case rather than in disturbed water, as would be the case if the propeller were located behind the gear case.

A still further object of the invention is to provide a propeller whose blades are of maximum width at the hub or central portion of the propeller, and gradually taper off toward the tips or ends of the propeller blades.

A further object of the invention is to provide a propeller having blades whose forward margins are formed with sharp cutting edges and are of such spiral formation that said edges will cut, or slice, the water at approximately right angles to the line of travel of the propeller, the rear margin of the propeller being shaped to operate in a plane approximately vertical to said line of travel, all to the end that the propeller will cause a minimum of disturbance, or churning of the water through which it passes and with the result that a maximum traction effect will be obtained.

A still further object of the invention is to provide a pinion shaft housing and gear case of novel external contour which is effective to reduce the friction of the gear case against the water, said external contour being such that substantially no vacuum will be created in the water behind the gear case as the craft moves forward.

With the above and other objects in view, the invention has particular relation to certain novel features of construction, operation, and arrangement of parts, an example of which is given in this specification, and illustrated in the accompanying drawings, wherein:—

Figure 1 shows a fragmentary side view of a water craft showing an out-board motor attached embodying the novel form of lower unit herein described.

Figure 2 shows a rear elevation of the lower unit.

Figure 3 shows a side view thereof.

Figure 4 shows a cross-sectional view taken on the line 4—4 of Figure 3.

Figure 5 shows a front elevation of the propeller, and

Figure 6 shows a vertical sectional view taken on the line 6—6 of Figure 3.

In the drawings, the numeral 1 designates a water craft having the out-board motor 2, of conventional construction, secured thereto in the usual way. This motor has the usual depending housing 3 for the drive shaft and secured to the lower end of this housing 3 is the pinion shaft housing 4 whose lower end is formed into the upper half of the gear case 5.

In the pinion shaft housing there is the vertical pinion shaft 6 which is mounted to rotate in the upper and lower bearings 7, 7a.

The lower end of the shaft 6 has the beveled pinion 8 fixed thereon which is in mesh with a corresponding pinion 9 which is fixed on the propeller shaft 10. This shaft is mounted in suitable bearings 11, 11, said pinions 8 and 9, the shaft 10 and the bearings 11 all being enclosed within gear case 5.

Fixed on the forward end of the shaft 11 there is a propeller, indicated generally by the numeral 12. The propeller has the blades 13, 13, whose maximum width is at the hub of the propeller and which taper outwardly toward their ends or tips. The forward margins of the blades are curved and terminate in sharp cutting edges. The said forward margins are so curved with respect to each other as to present a reverse curve from tip to tip of the propeller, and the blades are so pitched that said cutting edges will cut, or slice, the water in a plane substantially at right angles to the line of travel of the craft to the end that a maximum traction effect will be obtained without undue dissipation of power in churning or disturbing the water in front of the propeller. The rear margin of the propeller, from tip to tip, lies in a plane approximately vertical to the line of travel of the craft so that said rear, or trailing margin, of the propeller will move through the water with a minimum of resistance.

The gear case 5 has a depending fin 14 extending fore and aft, which acts with a stabilizing effect. It will be noted that the pinion shaft housing 4, as well as the gear case 5, are slightly flared rearwardly, the flared portions having slightly convex sides so as to move through the water with a minimum of friction. The rear portions of the pinion shaft housing and gear case are reduced in thickness forming the reduced portions 4a and 5a and forming also the abrupt vertical shoulders 15, 16.

As the craft moves through the water, the for-

ward convex sides of the housing 4 and gear case 5 only will come into frictional contact with the water and the water will be thrown outwardly each way thereby so that there will be no frictional contact of the water against the reduced portions 4a, 5a, and no vacuum will be formed with retarding effect behind the pinion shaft housing and gear case.

The drawings and description disclose what is now considered to be a preferred form of the invention by way of illustration only, while the broad principle of the invention will be defined by the appended claim.

What we claim is:—

A propeller unit comprising a housing whose lower end is formed into an approximately cylindrical gear case which has a blunt trailing end, the housing extending upwardly from the gear case and having attaching means at its upper end for attaching the same to a driving means, said upwardly extending portion being relatively thin and having a forwardly directed sharp cutting edge and having substantially flat sides which radiate rearwardly from said edge and are offset inwardly at approximately right angles to the longitudinal central line of the housing thus reducing the transverse diameter of the upwardly extended portion of the housing, said reduced portion being extended rearwardly with its sides approximately parallel to each other and to said central line of the housing, the trailing or rear edge of said reduced portion being blunt and arranged at substantially right angles to said central line, the rear end of the gear case being also offset inwardly at approximately right angles to the line of movement of the housing thus reducing the transverse diameter of the gear case, the points of reduction of the upwardly extended portion of the housing being in approximate alignment with the point of reduction of the gear case, a depending fin like stabilizer arranged in a common plane with said central line and being approximately triangular in cross-sectional contour and projecting rearwardly beyond the blunt edge of the housing.

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