June 27, 1950 J. G. PUGH 2,513,050

POWER-DRIVEN PROPELLING INSTALLATION FOR BOATS

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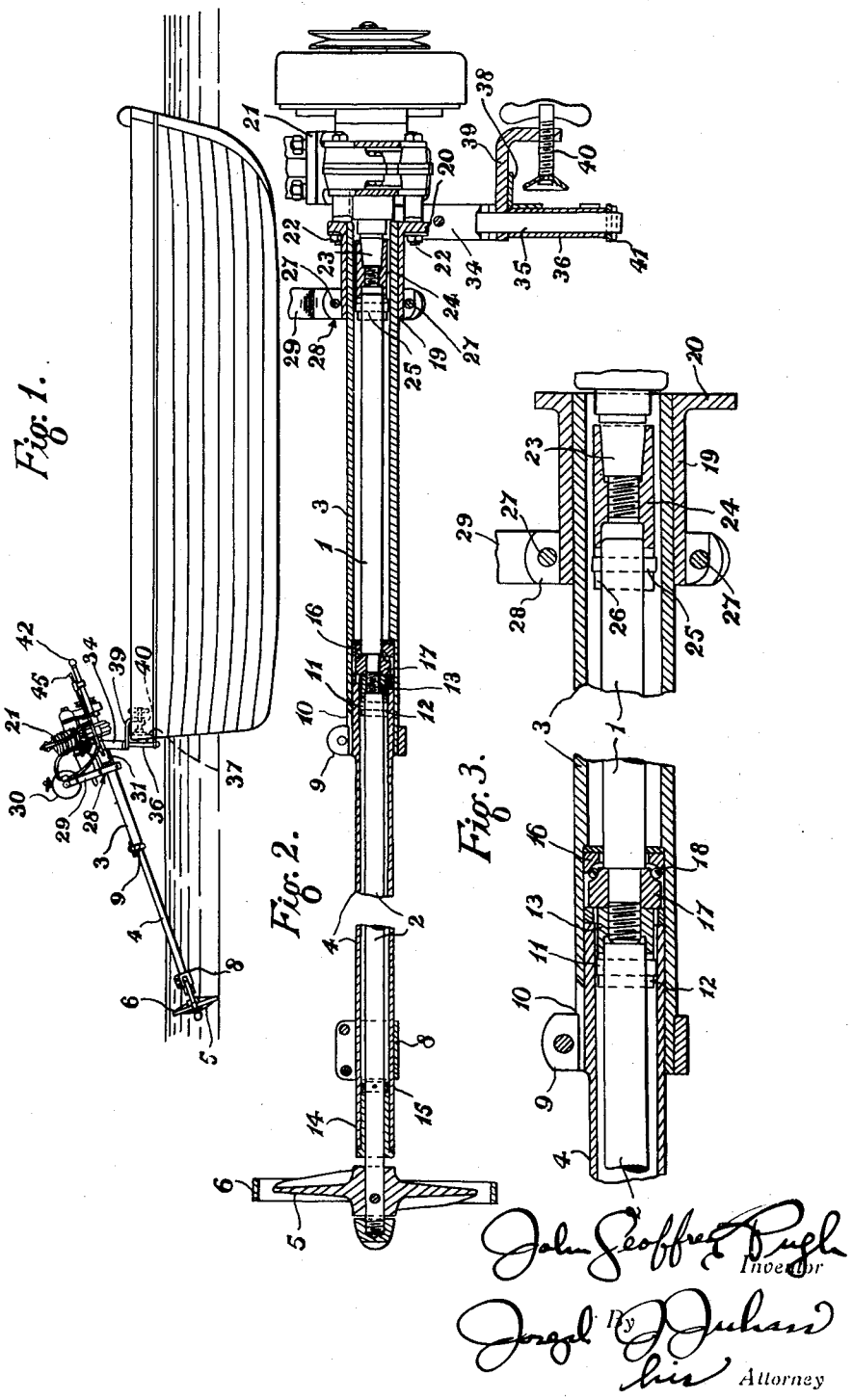


Fig. 1.

Fig. 2.

Fig. 3.

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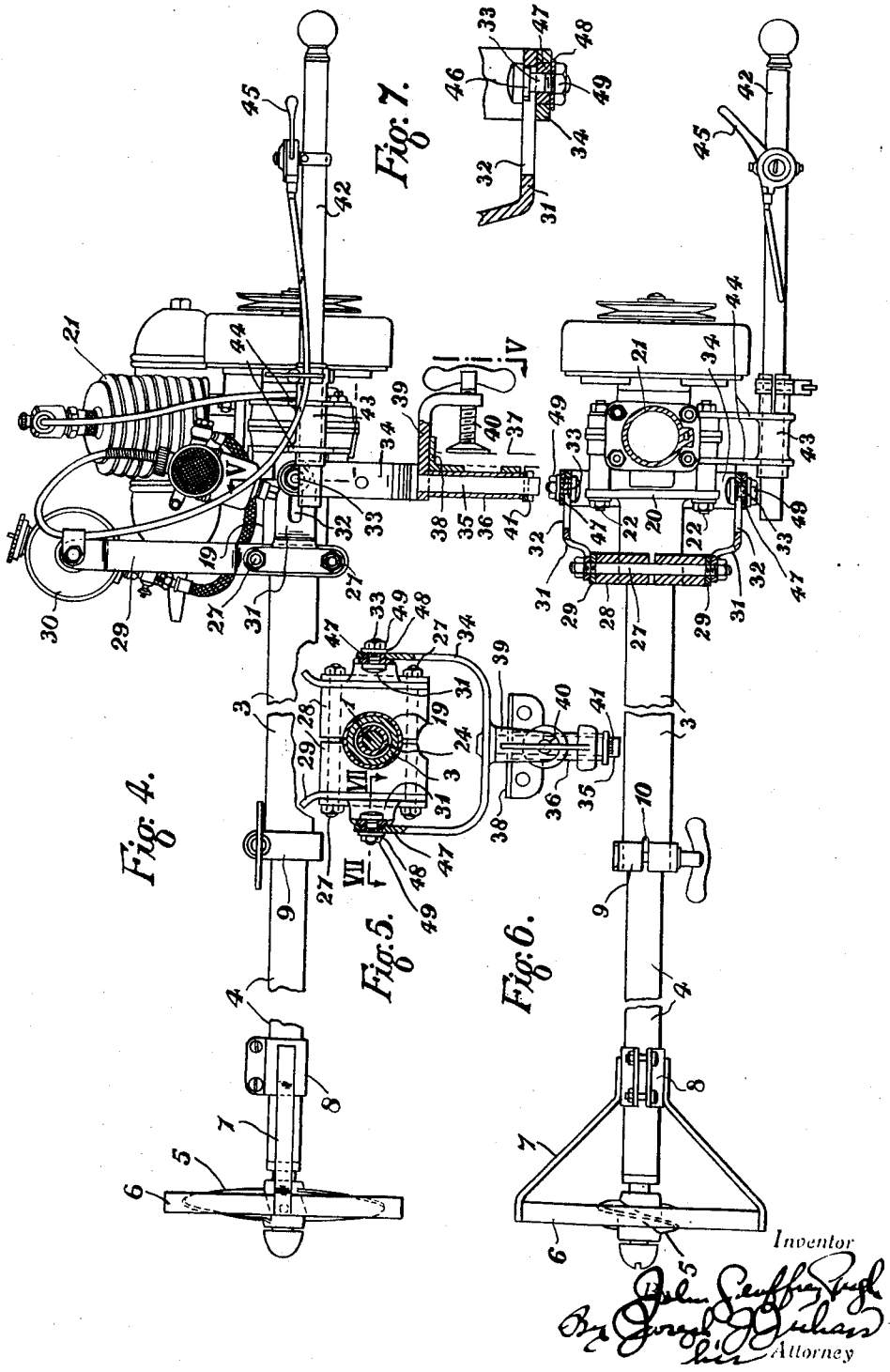


Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

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POWER-DRIVEN PROPELLING INSTALLATION FOR BOATS

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2 Claims. (Cl. 115—18)

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This invention relates to power-driven propelling means for boats, being of the kind comprising a detachable and portable power unit or installation adapted to be removably mounted at the stern of a boat and consisting of a longitudinally-extending outboard propeller shaft carrying a screw propeller at the rear end and having its forward end directly connected to a motor or engine forming part of the unit, said propeller shaft being angularly movable, both laterally and vertically, in order to permit of steering and to enable the propeller to be submerged.

One of the objects of the present invention is to provide an improved propulsion unit of the kind referred to, in which the inboard and outboard portions, lying respectively fore and aft of the fulcrum, are efficiently balanced or proportioned, as regards their relative weights, and without the use of vanes, blades or floats, so that when the propeller is submerged and the boat is in motion the unit is substantially in equilibrium, thus imposing little or no strain on the operator and enabling the unit to be easily and conveniently controlled or manoeuvred.

According to the invention a detachable and portable power-driven propelling unit for boats comprises a longitudinally-extending outboard propeller shaft carrying a screw propeller at the rear end and having its forward end directly connected to a motor or engine forming part of the unit, and being angularly movable both laterally and vertically; said unit being characterised by the fact that the propeller-shaft is contained within a casing that is supported, for angular movement in a vertical plane and also in a lateral direction, by a bracket or attachment part adapted to be mounted at the stern of a boat; and by the fact that the motor or engine is directly mounted upon said casing at a position forwards and inboard of the turning centre or fulcrum point about which the casing can turn in a vertical plane.

The weight of the inboard portion of the unit can thus be made substantially to balance the effective weight of the outboard portion, while the boat is in motion, without the use of vanes, blades or floats at the propeller end of the unit.

The propeller casing may conveniently be mounted upon a stationary attachment part by means of a universal or compound joint device, the casing being pivotally mounted in a forked bracket carrying a depending spigot or shank rotatably engaging a bearing socket on the stationary attachment part. The propeller casing

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may be axially adjustable relatively to the forked bracket, so that the correct balancing can be readily obtained according to circumstances or conditions. Also, the propeller shaft and its casing may be constructed in two readily-separable parts, to enable the unit to be divided for compactness and convenience in transit.

Figure 1 of the accompanying drawings is a diagrammatic side elevation showing a propelling unit, constructed according to the invention, mounted on the stern of a boat, with the propeller submerged, as in use.

Figure 2 is a longitudinal section through the propeller-shaft casing of the unit, and through the bracket fitting by which it is mounted on the boat.

Figure 3 is a longitudinal section through a portion of the propeller-shaft casing, on a larger scale, showing more clearly the connection of the propeller-shaft to the engine shaft, the thrust bearing, and the separable two-part construction of the propeller-shaft and casing.

Figure 4 is a side elevation of the propeller unit, with the supporting or attachment fitting in section.

Figure 5 is a cross-sectional view taken on line V—V, Figure 4.

Figure 6 is a plan view of the unit, with portions shown in section.

Figure 7 is a horizontal section on a larger scale through the pivotal mounting about which the unit can turn in a vertical plane, the section being taken on line VII—VII, Figure 5.

Referring to the said drawings, the propelling unit therein shown comprises a propeller shaft made in two sections 1, 2, contained within a long tubular casing also made in two sections 3, 4. A screw propeller 5 is fixed on the outer end of the shaft section 2, being protected by a guard ring 6, attached by arms 7 to a clip 8 fixed to the outer end of the casing section 4 (see Figure 6). The two sections 3, 4, of the casing are detachably connected together by fitting the inner end of section 4 within the outer end of section 3, and then tightening a clip 9 provided around the end of section 3, which is split at 10. The two shaft sections 1, 2, are detachably connected by means of a cross-pin 11 passing through the inner end of section 2 and having its ends engaged within open slots 12 in a socket member 13 screwed on to the end of section 1 and receiving the end of section 2. By unfastening clip 9, the two sections of the shaft and casing can be separated, thus reducing the overall length of the unit to facilitate trans-

port, as the two parts can then be compactly carried in an ordinary motor-car.

The outer end of shaft section 2 is mounted in a bearing sleeve 14 of lignum vitae (Figure 2) fitted in the end of casing section 4, and behind this bearing sleeve a collar 15 is fixed upon the shaft by a pin, so that the shaft section 2 is retained against outward endwise displacement. A thrust ball-bearing is provided within the casing section 1, this bearing consisting of a cup 16 fixed within the casing, a cone 17 fixed on a reduced end of shaft section 1, and antifriction balls 18 between the cup and cone.

Secured to the end of casing 3, 4, which is remote from the propeller, is a sleeve 19 having at its outer end a flange 20 to the outer face of which an internal-combustion engine 21 is bolted, as by bolts 22. The sleeve 19 could be integral with the casing, instead of being a separate part. The engine shaft 23 extends into the casing section 3 and carries a socket member 24 which receives and supports the end of shaft section 1, the drive being transmitted by a cross-pin 25 through the shaft, the ends of this pin engaging open slots 26 in said socket member 24.

Secured by bolts 27 to the shaft section 3, or to the sleeve 19 thereon, is a two-part clamp 28 which carries upwardly-extending side members 29 supporting the fuel tank 30, and it also carries forwardly-extending side arms 31 having longitudinal slots 32. These side arms 31 are pivoted, by means of bolts 33, to the upper ends of the side branches of a forked bracket 34 carrying on its underside a depending vertical spigot or shank 35 which is rotatably fitted within a vertical bearing socket 36 carried by an attachment part adapted to be detachably secured to the transom or stern part 37 (shown by dotted lines in Figure 4) of the boat. The said attachment part consists of an angle-sectioned transverse bracket 38 fitting over the top of the transom 37, and a forwardly-extending overhead arm 39 having a downturned end carrying a screw clamp device 40 the head of which is adapted to bear upon the inside surface of the transom. The clamp device can be operated from inside the boat, and the socket 36 is outside the boat. The spigot 35 may be retained within the socket 36 by means of a split pin 41, or other removable means.

By unfastening the clamp 40, the entire unit may be readily removed from the boat for transport or storage; or the socket 36 and attachment fitting may be left on the boat and the spigot 35 lifted out of the socket after the pin 41 has been removed.

It will be seen that the unit comprising the engine and propeller shaft and casing, is pivoted, for angular movement in a vertical plane, about a fulcrum constituted by the bolts 33 which support the unit on the forked bracket 34, and the engine is situated forwards of this pivot and inboard in relation to the transom of the boat, only the propeller with the propeller shaft and its casing being outboard. The position of the engine in relation to the pivotal axis formed by bolts 33 is so chosen that the weight of the inboard portion, including the engine and its accessory parts, substantially balances the weight of the outboard portion when the propeller is submerged and the boat is in motion. The correct balance to suit particular conditions or circumstances may be readily obtained by adjusting the slotted arms 31 backwards or forwards over the bolts 33. These bolts have flattened enlargements 46 that

fit and can slide within the slots 32 (see Figure 7) and carry brushes or rollers 47 that fit and can turn within circular holes in the arms of bracket 34, said brushes or rollers being slightly thicker than said arms. A washer 48 is mounted on the bolts outside these arms and when the nuts 49 are tightened up the brushes or rollers 47 bind upon the arms 31 and thus fix the adjustment of said arms 31 in respect to the bolts 33, but the brushes or rollers are free to turn, with the propeller unit, within the holes in the bracket 34, and thus the unit can be moved freely in a vertical plane.

Or, the desired adjustment for balance could be obtained by adjusting the position of the clamp 28 upon the propeller-shaft casing.

A control handle 42 is slidably adjustable within a sleeve bracket 43 carried by arms 44 extending laterally from the engine 21. By means of this handle 42, which may carry the throttle control 45, the whole unit may be readily manipulated from inside the boat, both as regards vertical angular movement for submerging the propeller, and lateral swinging movement about the axis of spigot 35 for steering.

In use, the depth to which the propeller 5 is submerged is controlled by manipulating the control handle 42 in a vertical direction, and steering is effected by moving the same control handle to one side or the other to cause the propeller casing and propeller shaft to swing laterally, about the axis of spigot 35, until it makes the appropriate angle to the longitudinal direction of the boat as will cause the desired deviation in the course of the boat.

As the inboard and outboard portions of the unit are balanced, little or no strain is imposed on the operator, and consequently the unit can be easily controlled and manoeuvred as required.

For parking purposes or for inspection of the propeller, the unit may be turned through 180° about the pivot member 35, to bring the propeller inboard.

If desired, the socket 36 may be lined with rubber in order to prevent engine vibrations from being transmitted to the boat.

Instead of the propeller-shaft casing being pivotally mounted in the forked bracket 34 having the vertical spigot 35, it may be mounted by a ball joint or other form of universal joint upon any suitable form of bracket adapted to be detachably secured to the stern of the boat.

I claim:

1. A detachable and portable propelling installation for boats comprising a longitudinal outboard propeller shaft, a propeller-shaft casing enclosing said shaft and having a flange at its forward end, an engine unit in direct driving connection with the propeller shaft and being bolted to the flange on the casing, a clamp fixed on the propeller-shaft casing at a position rearwards of the flange thereon, longitudinally-slotted side arms carried by opposite sides of the clamp and extending forwardly therefrom, a forked bracket carrying a depending spigot for rotatable and removable engagement with a bearing on the boat, pivot pins carried by the side branches of said forked bracket and being slidably adjustable in the slots of the slotted side arms, and means for fixing the pivot pins at adjusted positions in the slots whilst leaving the said side arms free to pivot about the axis of the pivot pins.

2. A detachable and portable propelling installation for boats comprising a longitudinal outboard propeller shaft, a propeller-shaft casing,

an engine unit in direct driving connection with the forward end of the propeller shaft and directly fixed rigidly to the forward end of the casing, a clamp fixed on said casing at a position rearwards of the engine unit, side arms having longitudinal slots therein carried by opposite sides of the clamp and extending forwardly therefrom, a forked bracket carrying a depending spigot for rotatable and removable engagement with a bearing on the boat, the side branches of said bracket having bearing holes therein, circular bushes rotatably engaged in the bearing holes and engaging by their end faces with the surfaces of the slotted side arms, pivot pins passing through said bushes and through the slots of the side arms, means for preventing the pivot pins from turning within the slots,

and nuts on the pins for clamping the bushes against the surfaces of the slotted side arms whilst leaving them free to turn within the bearing holes.

JOHN GEOFFREY PUGH.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,843,089	Peck	Jan. 26, 1932

FOREIGN PATENTS

Number	Country	Date
292,462	Italy	Jan. 19, 1932