Nov. 14, 1961 D. G. FRANK 3,008,445

OUTBOARD MOTOR LIFTING APPARATUS

Filed Aug. 4, 1958

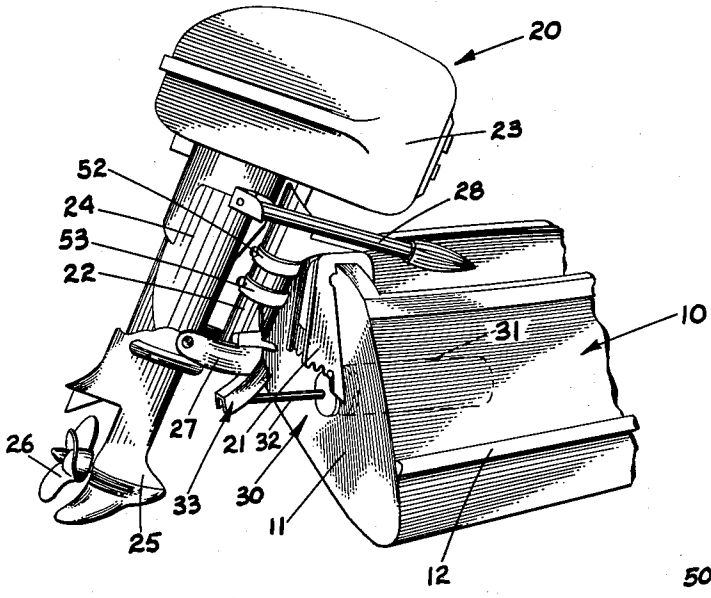


FIG. 1

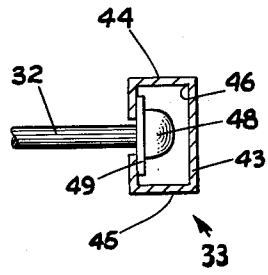


FIG. 4

FIG. 5

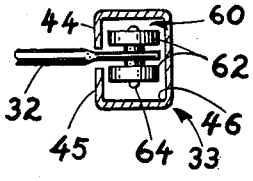
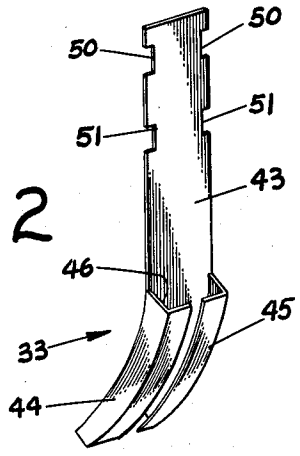


FIG. 2



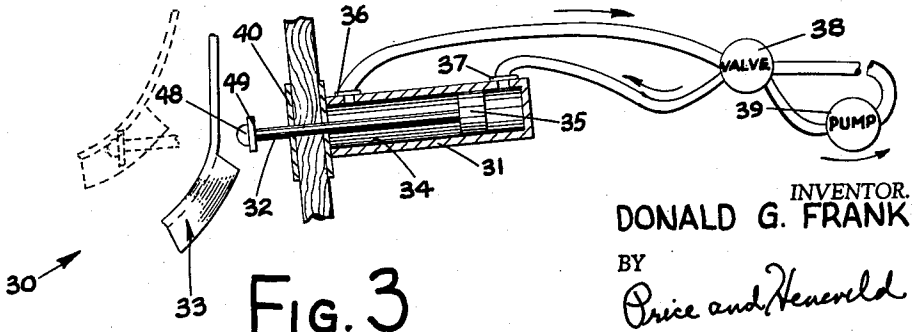


FIG. 3

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3,008,445

Patented Nov. 14, 1961

3,008,445

OUTBOARD MOTOR LIFTING APPARATUS

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Filed Aug. 4, 1958, Ser. No. 752,823

9 Claims. (Cl. 115—41)

This invention relates to outboard motors in general and more particularly to remote control lifts for such motors.

Outboard motors are normally mounted on the stern of a boat. They are usually pivotally mounted on the transom of a boat so that the propeller end is relatively freely movable upward and into shallow water. This is necessary to prevent damage to the motor in beaching the boat, traveling in shallow water, or on encountering any underwater objects.

The outboard motor has heretofore been required to be manually swung up out of the water, or into shallower water, on beaching a boat or in traveling in shallow water. This is particularly troublesome in boats which have the motor controls and steering located forward in the boat. In such instances this is usually a two man operation. Only with two persons can the motor be held in a partially raised position so that power is still available while the boat is maneuvered into shallow water. Otherwise the operator of the boat must gun the motor to gain speed, jump back into the stern of the boat and swing the motor up, then get back up forward in the boat and hope he has sufficient speed to coast through the water to his destination.

It is an object of this invention to provide a power lift for raising the propeller end of an outboard motor into shallower water and into a less obstructive position.

It is also an object of this invention to have such power lift means remotely controllable.

The power lift means of this invention are intended to provide an optional degree of lift for an outboard motor mounted on the stern of a boat.

It is a further object of this invention to provide remotely controlled power lift means for an outboard motor which will not interfere with its freedom of motion upon encountering an underwater object during normal operation of the boat.

It is an even further object of this invention to provide a simple power lift structure or device which may be easily installed by an individual for use with most types of outboard motors and in most boats.

These and other objects and advantages in the practice of this invention will be more apparent in the illustration and description of a working embodiment of the invention, as hereinafter set forth.

In the drawings:

FIG. 1 is a perspective view of the stern of a boat having an outboard motor mounted thereon and including the power lift means of this invention.

FIG. 2 is a perspective illustration of the guide member of the power lift means of this invention.

FIG. 3 is a schematic illustration of the power lift means of this invention.

FIG. 4 is an enlarged cross sectional view of the plunger and guide means of the power lift of this invention.

FIG. 5 shows a modified form of rod end and an antifriction member which rides within the guide.

As will be shown, this invention deals with outboard motor boats which have the outboard motor mounted on the transom of the boat, and particularly with motors having their controls located forward in the boat. The lift device of this invention is mounted in the stern of the boat and has its controls such as may be located near the front of the boat with the motor controls. A guide part of the lift mechanism is attached to the outboard motor. A power cylinder is disposed in the stern of the boat and includes a plunger which extends through the transom of the boat and is engaged with the guide member on the motor. Upon actuation of the power cylinder and plunger engages the guide and causes the motor to pivot about its support attachment on the transom of the boat to lift the propeller into shallower water.

Referring to the drawings in further detail, there is shown a boat **10** having a stern or transom **11**. The waterline stringer **12** is shown and indicates the general draw of the boat in the water.

An outboard motor **20** is mounted on the transom **11** by means of a stern bracket or motor mount **21**. The motor mount **21** is securely engaged to the transom **11** and includes a pivotal connection by means of which the outboard motor may be vertically pivoted about the upper edge of the boat transom. The details of this mount and the pivotal connection are considered sufficiently well-known and understood to need no further explanation or illustration than has been given.

The outboard motor **20** includes a pivot post **22** about which it is pivotal to right and left in navigating the boat. The motor unit **23** rests on the head of the pivot post **22** and the shrouded drive housing **24** extends down into the water. The drive housing terminates in a gear drive housing **25** which includes the propeller **26**. A drive housing support **27** is connected to the pivot post **22** and is part of the pivotal connection of the outboard motor thereto. The outboard is pivotal to right and left on the pivot post **22** and the pivot post is itself vertically pivotal on the motor mount **21**.

The outboard motor **20** is shown to include a steering control handle **28**. However, it is to be assumed that the outboard motor also includes steering and other controls which are located forward in the boat **10**. The cables and such for remote control steering and motor control are believed sufficiently well-known to require no illustration.

The lift mechanism **30** of this invention includes a power cylinder **31**, which is mounted in the boat **10**, and includes a power actuated rod **32** that is engaged with a guide member **33** on the outboard motor.

The power cylinder **31** is a hydraulic cylinder. It includes a fluid chamber space **34** within which is disposed a piston member **35**. The piston member forms part of the rod **32** that is intended to engage the outboard motor. The power cylinder includes fluid connections **36** and **37** engaged at opposite ends thereof. These, a valve **38**, a pump mechanism **39**, and interconnecting fluid lines, provide a closed fluid system for reciprocating the piston within the cylinder and moving the rod **32** relative to the outboard motor when properly disposed through the stern of boat **10**.

The fluid control valve **38** may be a four-way valve in order to control fluid flow to either end of the power cylinder **31**. The pump **39** may be driven by an electric motor, if a battery is provided in the boat, or it may be manually operated if there is no battery. In the latter instances an accumulator may be provided for reserve fluid power.

The power cylinder **31** is disposed in the stern of boat **10** with the end of rod **32** extending through the transom **11**. The end closure of the cylinder **31**, through which the rod **32** extends, is fluid tight to assure a closed fluid operating system for the power cylinder. The rod **32** extends through the transom **11** above the waterline of the boat. Although an expensive watertight gland is not required, it is desirable that some form of water seal be provided. A rubber disc, as **40** may serve adequately.

The guide member **33** is secured to the pivot post **22**

of the outboard motor. The guide member 33 is shown in FIG. 2 to include a strap base 43 having its lower end formed to include side flanges 44 and 45 bent over to form a channel groove 46. The flanges 44 and 45 provide a guide foot within which is received the end of the reciprocal rod 32. The edges of the flanges 44 and 45 are spaced apart sufficient to receive the rod 32 therebetween. The rod 32 includes a ball head 48 and shoulder portion 49 that serves to keep the rod engaged within the channel grooves 46 once received therein.

In FIG. 5, the end of rod 32 is shown as modified to accommodate roller means 60. The end of the rod 32 is flattened or otherwise formed to have a pair of roller members 62 rotatably engaged to the sides thereof on a pin 64. The rollers 62 are of a size readily received within the channel groove 46 of the guide 33 and such as will engage the inwardly disposed flanges 44 and 45 of the guide member. This is in the manner of the shoulder portion 49. Accordingly, in raising the outboard motor 20 the rollers 62 engage and ride on the strap base 43. When the motor is being lowered by the power means, the rollers 62 ride on the flanges 44 and 45 to pull the propeller end of the motor down into the water.

The strap base 43 of the guide member 33 is undercut at 50 and 51 near its upper end to receive retainer straps 52 and 53. These are used to fasten the guide member 42 to the pivot post 22 of the outboard motor, as shown in FIG. 1. The guide member 42 is mounted so that the end of the rod 32 is disposed to engage the strap base 43 just above the guide foot. Subsequent actuation of the rod 32 causes it to push against the strap base 43, to move the guide member out, and to slide into the guide foot portion.

Operation

The power cylinder 31 and the guide member 42 are mounted as previously mentioned. The controls for the valve and pump mechanism 38 and 39 of the cylinder are located forward in the boat 10 near the outboard motor controls.

When it is desired to lift the propeller end of the outboard motor 20 into shallower water the controls for the valve and pump 38 and 39 are actuated to circulate fluid in the closed system of the power cylinder so as to extend the plunger rod 32. The ball end or roller of the rod engages the guide member 42 just over the guide foot formed by the side flanges 44 and 45. As the rod 32 pushes against the strap base 43 of the guide member 42 it causes the outboard motor to pivot on the motor mount 21. This moves the guide member from the full to dotted line position shown by FIG. 3 and causes the rod to be received in the channel groove 46 of the guide foot.

The extended stroke of the rod 32 is such as will raise the lower end of the outboard motor 20 above the keel of the boat 10. If the end of the motor is only partially raised when some unforeseen underwater object is encountered the motor will simply pull the piston rod to its fully extended position.

The lift disclosed is principally intended to raise the propeller end of an outboard motor up above the keel of the boat. However, the pump and valve mechanism may be used to just slightly raise the motor for shallow water where maximum power is desirable.

The propeller end of the outboard motor 20 may be lowered into the water in either of two ways. The control for valve 38 may be released to enable the weight of the outboard motor to push the rod 32 back into the power cylinder 31, or the valve 38 may be positioned to reverse the direction of fluid flow in the power cylinder 31 and forceably draw the propeller end of the motor unit down into the water.

It will be appreciated that the freely pivotal nature of the outboard motor 10, as regards normal deep water operation where such freedom is important in case some underwater object is encountered, is in no way adversely affected by this invention. The outboard motor control proposed is not engaged to the outboard motor until the lift operation is to be initiated.

While a preferred embodiment of this invention has been described, it will be understood that other modifications and improvements may be made thereto. Such of these modifications and improvements as incorporate the principles of this invention are to be considered as included in the hereinafter appended claims unless these claims by their language expressly state otherwise.

I claim:

1. A power lift for outboard motors, comprising: a power cylinder adapted to be mounted in the stern of a boat and having a piston rod extending therefrom and adapted to extend through the transom of said boat, a guide member and means of attaching said guide member to a part of an outboard motor pivotal on said transom, said guide member including a channel portion receptive of the end of said piston rod, said rod end including a shoulder received within said channel portion from one end of said guide member.

2. A power lift for outboard motors, comprising: a power cylinder adapted to be mounted in the stern of a boat and having a piston rod extending therefrom and adapted to extend through the transom of said boat, a guide member and means of attaching said guide member to a part of an outboard motor pivotal on said transom, said guide member including a channel portion receptive of the end of said piston rod, said channel portion including a bearing surface against which the end of said rod is engaged and a flanged portion receptive of said rod and for retaining said rod end therewithin.

3. A power lift for outboard motors, comprising: a power cylinder adapted to be mounted in the stern of a boat and having a piston rod extending therefrom and adapted to extend through the transom of said boat, a guide member and means of attaching said guide member to a part of an outboard motor pivotal on said transom, said guide member including a channel portion receptive of the end of said piston rod, said channel portion including a bearing surface against which the end of said rod is engaged and a flanged portion receptive of said rod and for retaining said rod end therewithin, said rod end including a shoulder portion received within said flanged portion from one end of said guide member.

4. A power lift for outboard motors, comprising: a power cylinder adapted to be mounted in the stern of a boat and having a piston rod extending therefrom and adapted to extend through the transom of said boat, a guide member and means of adapting said guide member to a part of an outboard motor adapted to be pivoted on said transom, said guide member including a channel portion receptive of the end of said piston rod, said channel portion including a bearing surface against which the end of said rod is engaged and a flanged portion receptive of said rod and for retaining said rod end therewithin, said rod end including a shoulder portion received within said flanged portion from one end of said guide member, and remote control means operatively interconnected to said power cylinder and disposed apart therefrom for selectively activating said piston rod against said guide member and adapted to pivot said guide member and said motor to which it is attached about the pivotal connection thereof on said boat transom.

5. A boat having an outboard motor pivotally mounted on the stern thereof and remote controlled means for raising and lowering the drive end of said motor into shallower and deeper water while in operation and otherwise, said lifting means comprising; a power motor means mounted within the stern of said boat, a rod extended from one end of said power motor means and operated thereby, said rod extending through the transom of said boat and disposed to engage said motor,

remote control means operatively connected to said power motor means, said rod being reciprocal in substantially a horizontal plane and operative to pivot said motor about said transom upon actuation of said power motor means.

6. A boat having an outboard motor pivotally mounted on the stern thereof and remote controlled means for raising and lowering the drive end of said motor into shallower and deeper water while in operation and otherwise, said lifting means comprising; a power cylinder mounted within the stern of said boat, a plunger extended from one end of said cylinder and operated thereby, said plunger extending through the transom of said boat, remote control means operatively connected to said power cylinder, a guide member receptive of the end of said plunger, means for mounting said guide member on said outboard motor in position to receive the end of said plunger, said end of said plunger being free of said guide member when said motor is in the non-pivoted position, said plunger being reciprocal normal to said transom and operative to pivot said motor about said transom upon engagement thereof with said guide member.

7. A boat having an outboard motor pivotally mounted on the stern thereof and remote controlled means for raising and lowering the drive end of said motor into shallower and deeper water while in operation and otherwise, said lifting means comprising; a power cylinder mounted within the stern of said boat, a plunger extended from one end of said cylinder and operated thereby, said plunger extending through the transom of said boat above the waterline thereof, remote control means operatively connected to said power cylinder, a guide member receptive of the end of said plunger, means for mounting said guide member on said outboard motor in position to receive the end of said plunger, said plunger being reciprocal normal to said transom and operative to pivot said motor about said transom upon engagement thereof with said guide member, said guide member having a flanged portion receiving the end of said plunger into positive guided relation therewith only after the initial engagement and pivotal movement thereof.

8. A device for raising and lowering the drive end of an outboard motor out of and into the water, with said

motor pivotally mounted on the transom on a boat, and comprising; a hydraulic cylinder having a fluid pressure operated piston member mounted therein and the piston rod thereof extended through the end of said cylinder, means for mounting said cylinder with said piston rod extending through the transom of said boat, a guide member and means of attachment to said outboard motor in a position for engagement by said piston rod, said guide member including side wall flanges receptive of said piston rod therebetween and within, and roller means provided on the end of said piston rod for engagement with said guide member, said roller means forcing said guide member and the drive end of said outboard away from the transom of said boat upon the extension of said piston rod, said motor pivoting on its transom mounting, said roller means being received within said side wall flanges of said guide member following the initial actuation of said piston member and being engageable therewith in pulling said guide member and said motor back towards said transom upon a reversal of the travel of said piston rod and member.

9. A boat having an outboard motor pivotally mounted on the stern thereof and remote control means for raising and lowering the drive end of said motor into shallower and deeper water while in operation and otherwise, said lifting means comprising; a hydraulic cylinder mounted within the stern of said boat, a plunger extended from one end of said cylinder and operated thereby, said plunger extending through the transom of said boat and disposed to engage guide means on said motor, the end of said plunger being free of said guide means when said motor is in the non-pivoted position, control means operatively connected to said power cylinder, said plunger being reciprocal in substantially a horizontal plane and operative to engage said guide means and pivot said motor about said transom; the end of said plunger having a rigid connection with said guide means when said motor is in a pivoted position.

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