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L. P. POST

2,875,722

OUTBOARD MOTOR REMOTE STEERING CONTROL

Filed Dec. 5, 1955

3 Sheets-Sheet 1

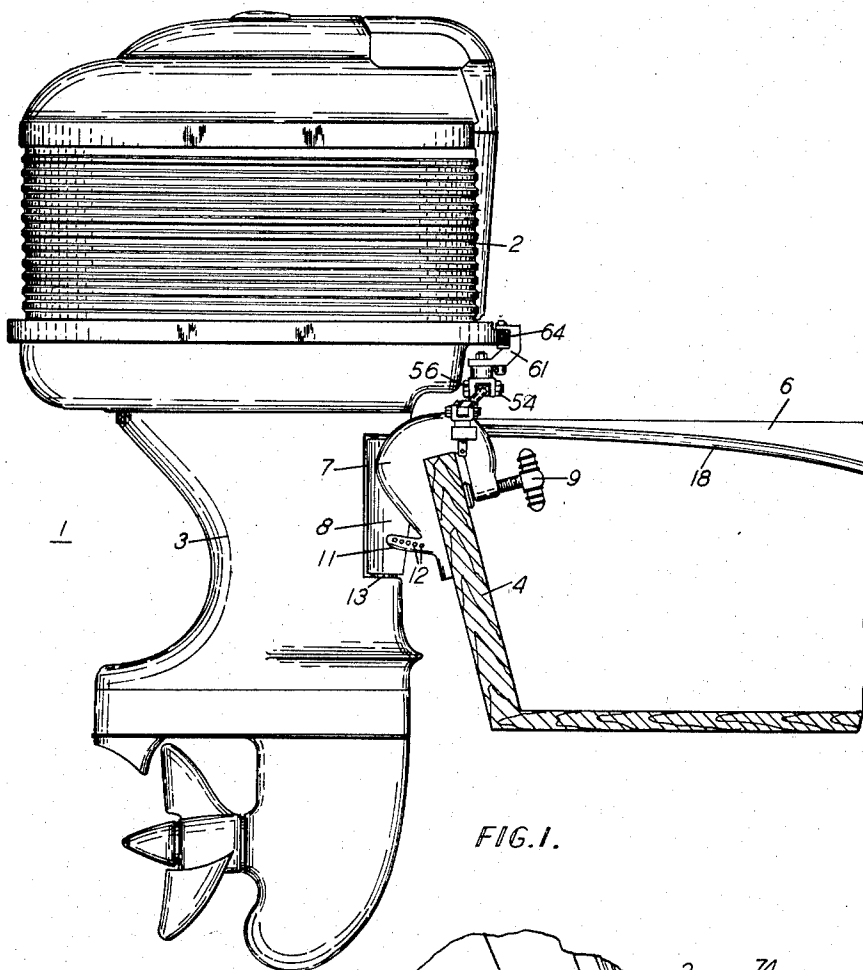


FIG. 1.

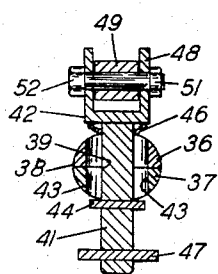


FIG. 9.

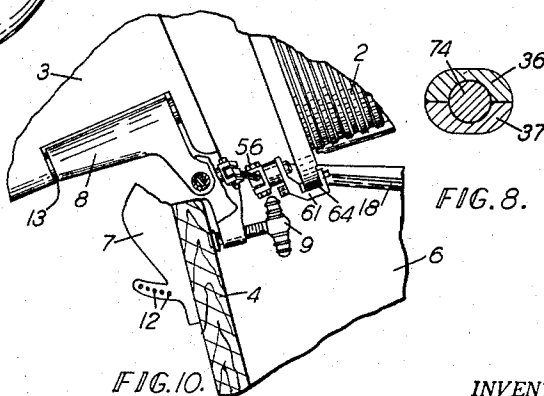


FIG. 8.

INVENTOR.
LLOYD P. POST

BY *Steve W. Grambow*

ATTORNEY

March 3, 1959

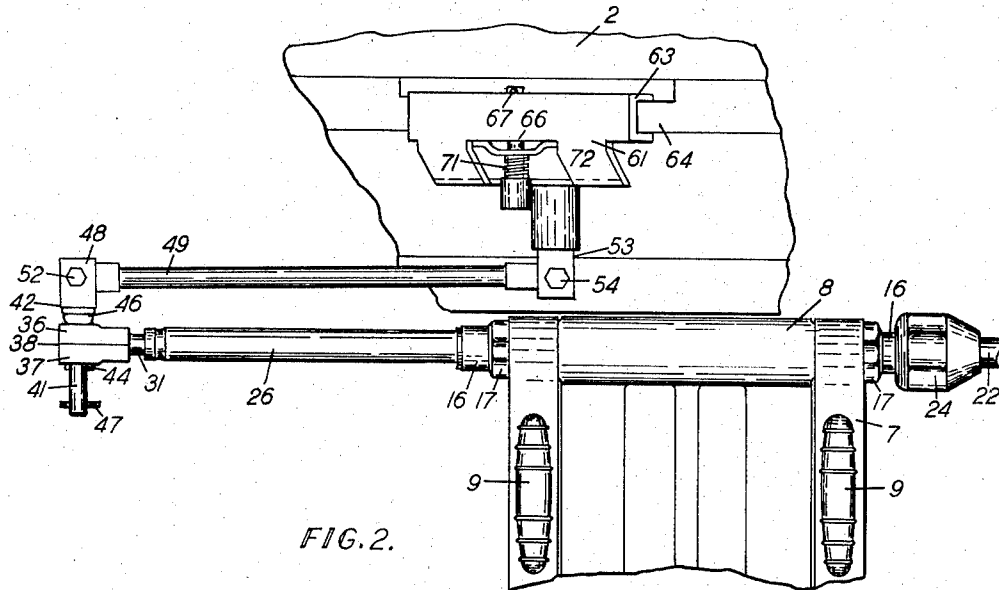
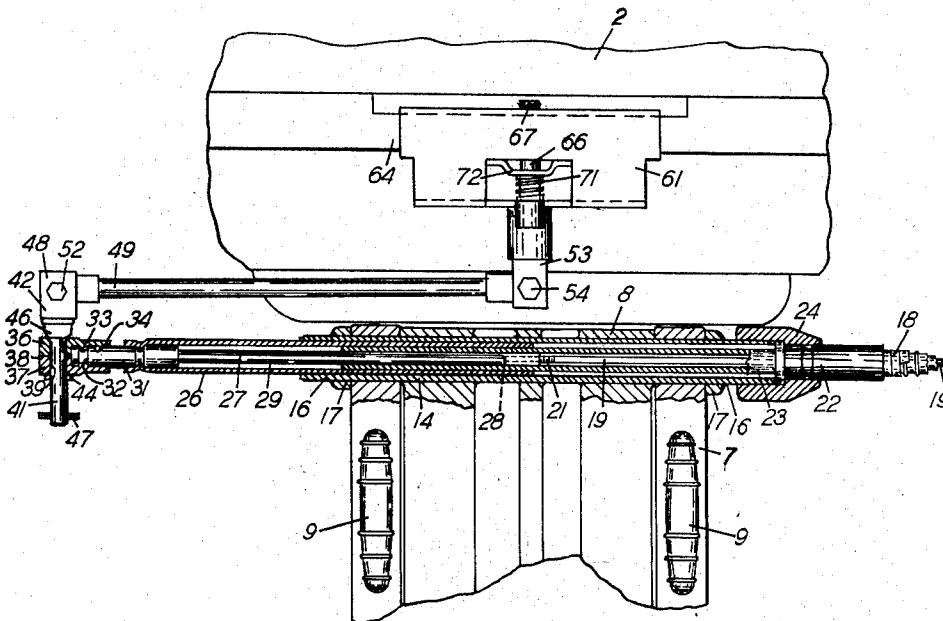
L. P. POST

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3 Sheets-Sheet 2



INVENTOR.
LLOYD P. POST

BY *Sten W. Grambow*

ATTORNEY

March 3, 1959

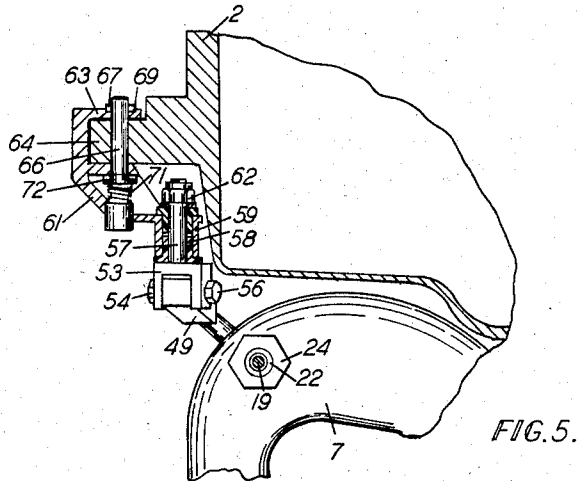
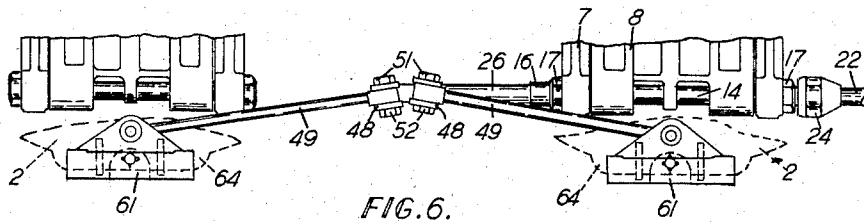
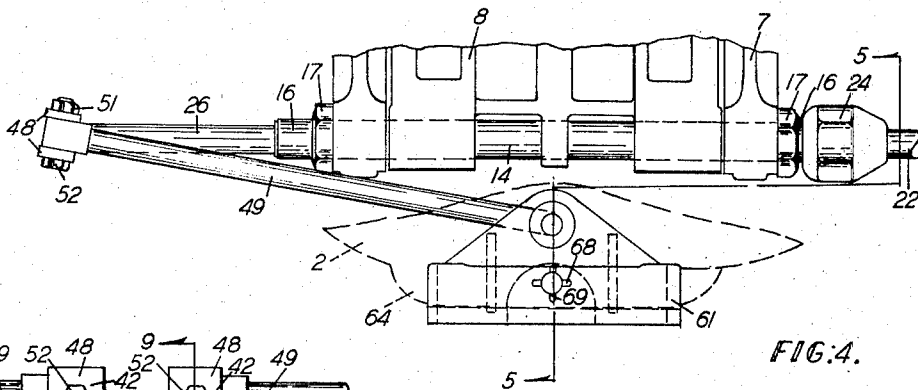
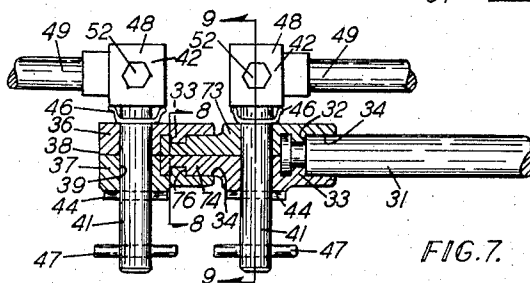
L. P. POST

2,875,722

OUTBOARD MOTOR REMOTE STEERING CONTROL

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3 Sheets-Sheet 3



INVENTOR.
LLOYD P. POST
BY *Steve W. Stamban*
ATTORNEY

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2,875,722

OUTBOARD MOTOR REMOTE STEERING CONTROL

Lloyd P. Post, Fond du Lac, Wis., assignor to Kiekhaefer Corporation, Cedarburg, Wis., a corporation of Wisconsin

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8 Claims. (Cl. 115—18)

This invention relates generally to outboard motors and more specifically to an improved remote steering control system for an outboard motor.

Remote steering control systems whereby the operator may from a forward position in the boat orderly and effectively control the steering of the outboard motor are well known in the art. Some of the difficulties encountered in these prior art systems are (1) the inability to tilt the engine without bending or damaging the steering mechanism, (2) the necessity of a mounting member fastened to the boat for supporting the end of the remote steering cable, and (3) installation problems in aligning and adapting the remote steering control system to the outboard motor for proper operation.

It is therefore an object of the present invention to provide an improved remote steering control system for an outboard motor that obviates the aforementioned disadvantages of the prior art systems.

A more specific object of the invention is to provide an improved remote steering control system for an outboard motor that permits tilting of the outboard motor without damaging the steering system as when the outboard motor is tilted upwardly upon hitting a sunken object.

Another object of the invention is to provide an improved remote steering control system for an outboard motor that eliminates the necessity for aligning the steering system to the outboard motor.

A further object of the invention is to provide an improved remote steering control system for an outboard motor that eliminates the need for a support member mounted on the boat to support the end of the steering system.

Still another object of the invention is to provide an improved remote steering control system that is simpler to install and to disconnect than prior art systems.

Another object of the invention is the provision of a quick-release link mechanism for connecting the steering control system to the motor.

Another object of the invention is to provide an improved remote steering control system that may be readily adapted for dual outboard motor steering operation.

Objects and advantages other than those set forth above will be apparent from the following description when read in connection with the accompanying drawings, in which:

Fig. 1 is a side elevation view of an outboard motor mounted on the transom of a boat and embodying the invention;

Fig. 2 is an enlarged fragmentary view partly in perspective and partly in front elevation of the outboard motor of Fig. 1 showing the remote steering control mechanism and the outboard motor pivotably turned about its vertical pivot to drive the boat in a port direction;

Fig. 3 is an enlarged fragmentary view in front elevation and partly in section of the outboard motor of Fig.

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1 showing the remote steering control mechanism and the outboard motor in a position to drive the boat along a straight line course;

Fig. 4 is a plan view of the structure of Fig. 3;

Fig. 5 is a fragmentary side elevation section view partially in perspective taken along line 5—5 of Fig. 4;

Fig. 6 is a fragmentary plan elevation view showing a dual outboard motor steering arrangement;

Fig. 7 is an enlarged fragmentary view of a portion of the structure of Fig. 6;

Fig. 8 is a section view taken along line 8—8 of Fig. 7;

Fig. 9 is a section view taken along line 9—9 of Fig. 7; and

Fig. 10 is fragmentary view partially in section of the outboard motor of Fig. 1 showing the remote steering control mechanism with the motor in a tilted position.

As shown in the drawings, a preferred embodiment of this invention is illustrated as applied to a conventional outboard motor 1 having a cowl 2 mounted on a hollow or tubular drive shaft housing 3. The outboard motor 1 is fastened pendently to the transom 4 of a boat 6 by attachment means comprising a clamp bracket 7 and a swivel bracket 8. The clamp bracket 7 is adapted to engage over the upper edge of the transom 4 and carries a clamping screw 9 at the lower end adapted to engage the inside of the transom 4 to clamp the transom between the end of the screw 9 and the clamp bracket 7. The clamp bracket 7 is provided with a rearwardly projecting horn 11 having spaced openings 12 therein adapted to receive an adjustable thrust pin for selectively positioning the housing 3 depending upon the desired slope of the housing 3 to the vertical. The swivel bracket 8 of the attachment means is L-shaped and is pivotably connected to the outboard motor 1 by means of a vertically disposed pivot pin 13 to permit dirigible movement of the outboard motor about the pin axis. The swivel bracket 8 is further pivotably connected to the clamp bracket 7 by means of a horizontally disposed tubular pin 14 passing through openings formed by the upper ends of the clamp bracket 7 and swivel bracket 8 respectively. The pin 14 is provided with threaded ends 16 and is secured to the attachment means by means of lock nuts 17.

According to the invention a remote steering control is provided for the outboard motor 1 whereby an operator sitting in the front of the boat can turn the outboard upon the vertical pin or axis 13 and hold the outboard in any pivotal position as may be desired for steering purposes.

In general the remote steering control is effected through push-pull means pivotally secured to the cowl 2 or housing 3 and which effectively secures the motor in any desired position of steering. The push-pull means is supported to pivot freely with the motor 1 upon the axis of horizontal pin 14 in a manner that avoids interference with the steering control when the motor is pivoted on pin 14.

One embodiment of remote steering control system comprises in part a hollow, flexible conduit 18 through which a flexible push-pull actuating rod 19 is slidably disposed as shown in Fig. 3. One end of the flexible conduit 18 and the corresponding end of the actuating rod 19 are secured to a control mechanism such as a steering wheel, not shown, and the other end 21 of the rod 19 is threaded for engagement with a threaded bore 28 shown dotted in Fig. 3 of a rod 27 axial to and forming a part of a steering control member shown as a tubular element 26 reciprocally disposed within the pin 14. The flexible conduit 18 is provided at its other end with a fitting 22 having a tubular guide member 23 slidably extending within an annular opening 29 formed by the rod 27 and tubular element 26. The fitting 22 is se-

curely connected to one of the threaded ends 16 of the pin 14 by means of a coupling nut 24.

The tubular element 26 is provided at one end 31 with an annular groove 32 adapted to engage a link mechanism comprising in part an annular rib 33 of a bore 34 formed by mating sections 36, 37 of a novel split coupling 38 to secure the tubular element 26 to the link mechanism. The coupling sections 36, 37 form an opening 39 transverse to the bore 34 for pivotably accommodating a rod 41 formed by one end of a connector element 42. The lower coupling section 37 is provided with diametrically opposed slots 43 as shown in Fig. 9 merging with the opening 39 to form a passageway for a pin 44 carried by the rod 41. The connector element 42 is fastened to the coupling 38 by insertion of the rod 41 and pin 44 through the opening 39 and slots 43 against the bias of a spring 46 and turning the rod 41 so that the pin 44 is no longer in register with the slots 43. The lower section 37 is prevented from dropping off of the rod 41 when removing the tubular element end 31 from the coupling 38 by means of a key 47 constructed so that it cannot pass through the slots 43. The other end 48 of the connector element 42 is U-shaped and accommodates one end of a push-pull rod member 49 which is pivotably connected thereto by means of a nut 51 and bolt 52. The other end of the rod member 49 is pivotally connected to a U-shaped end of a coupling 53 as shown in Fig. 5 by means of a nut 54 and bolt 56 passing through openings formed by the end of the rod 49 and the U-shaped end of the coupling 53. The other end of the coupling 53 forms a threaded stud 57 which is pivotably disposed within a bearing 58 mounted in an opening formed by one end 59 of a motor mounting bracket 61 and secured thereto by means of a lock nut 62. The motor mounting bracket 61 forms a U-shaped connecting element 63 at its other end transversely disposed to the motor mounting bracket opening and adapted to receive a cowl projection 64. The connecting element 63 is removably secured to the projection 64 by means of a bolt member 66 biased by a spring 71 and provided at one end with a pin 67 transverse thereto passing through a slotted opening 68 as shown in Fig. 4 formed by the connecting element 63 and cowl projection 64. The pin 67 is adapted to seat in a narrow groove 69 as shown in Figs. 4 and 5 formed by the connecting element 63 to secure the connecting element 63 to the projection 64 upon turning the bolt 66 ninety degrees after it has been extended through both members 63, 64. Removal of the connecting element 63 is accomplished by pressing the bolt 66 against the action of the spring 71 until the pin 67 is clear of the groove 69, turning the bolt 66 ninety degrees until the pin 67 lines up with the slotted opening 68 and withdrawing the bolt 66 from the connecting element 63 and projection 64. The bolt 66 is retained to the mounting bracket 61 by means of a U-shaped disk 72 mounted to the connecting element 63 and having a circular opening through which the bolt 66 extends. The withdrawal of the bolt 66 is limited by the pin 67 which butts up against the disk 72 preventing further removal of the bolt 66.

This invention may be readily adapted for dual outboard motor steering operation as shown in Figs. 6 and 7. The coupling 38 is replaced by a split coupling 73 having a rim 33 and bore 34 similar to coupling 38 and which in the assembled position forms a projecting spindle 74 having an annular groove 76 similar to the groove 32 of the tubular element end 31. The coupling 73 is adapted to receive a coupling identical to the aforementioned coupling 38. The connector element 42, rod member 49, coupling 53 and motor mounting bracket 61 are similar for each outboard motor and hence have been given the same numbers. In order to permit selective tilting of each of the motors, the spindle 74 is loosely disposed within the coupling 38 so that tilting

only one of the motors permits relative rotation of the spindle 74 with respect to the coupling 38 or vice versa.

In operation of the improved remote steering control system, movement of the actuating rod 19 in either direction by means of a steering wheel, not shown, or similar device causes the tubular element 26 and rod 27 to be reciprocally moved within the tubular pin 14. The link mechanism connects the tubular element 26 to the outboard motor cowl projection 64 to effectively transmit the rectilinear reciprocal motion of the tubular element 26 to the outboard motor 1 causing the motor to be pivotably moved in an arc about the pivot pin 13. Since the outboard motor 1 and the link mechanism tilt about the same axis, that is the axis of the pin 14, the link mechanism is not subjected to any stresses, particularly bending stresses, the tubular element merely being rotatively moved within the pin 14 as the motor is tilted as shown in Fig. 10.

Various embodiments of the invention may be employed within the scope of the appended claims.

It is claimed and desired to secure by Letters Patent:

1. In an outboard motor supported on a hollow horizontal pin for pivotal movement in one direction and on a vertical pin for pivotal movement in another direction, the combination of: steering control means reciprocally disposed within said hollow horizontal pin for rectilinear movement therein, and link means connecting said steering control means to said motor for imparting the rectilinear reciprocal motion of said steering control means to said motor whereby said motor is pivotably moved in an arc about said vertical pin for steering same.

2. The combination of claim 1 wherein said steering control means comprises an elongated cylindrical member coaxial with said horizontal pin.

3. The combination of claim 1 wherein said steering control means comprises an elongated tubular member coaxial with said horizontal pin and having an axial rod, and a flexible actuating element connected to said rod for imparting reciprocal movement to said rod and said member.

4. An outboard motor structure having in combination: a clamp bracket adapted to be attached to a boat, a swivel bracket, a hollow horizontal pin pivotally connecting said swivel bracket to said clamp bracket, a housing, a vertical pin pivotably connecting said housing to said swivel bracket, a cowl encasing the power head of the motor mounted on said housing, steering control means reciprocally disposed within said hollow horizontal pin for rectilinear movement therein, and link means connecting said steering control means to said cowl to impart the reciprocal rectilinear movement of said steering control means to said cowl causing said housing to be pivotably moved in an arc about said vertical pin.

5. The combination of claim 4 wherein said steering control means comprises an elongated cylindrical member coaxial with said horizontal pin.

6. The combination of claim 4 wherein said steering control means comprises an elongated tubular member coaxial with said horizontal pin and having an axial rod, and a flexible actuating element connected to said rod for imparting reciprocal movement to said rod and said member.

7. In an outboard motor having a swivel bracket for dirigibly supporting said motor, a clamp bracket disposed forward of the motor and adapted for securement to the transom of a boat, a hollow horizontally disposed pin member pivotally joining the swivel bracket to the clamp bracket and about which the motor may be tilted in a vertical plane with respect to the clamp bracket, a reciprocating member slidably disposed within said pin member and having one end thereof extending outwardly therefrom, means remotely controlled to reciprocate the reciprocating member, releasable coupling means secured on the outer end of said reciprocating member, and a

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linkage member having the ends thereof pivotally connected to the coupling means and the motor, respectively, whereby sliding movement of the reciprocating member may effect dirigible movement of the motor for steering same.

8. In combination in an outboard motor supported for pivotal movement vertically on a horizontal pin and for pivotal steering movement horizontally on a vertical pin, steering control means for the motor including push-pull means pivotally connected at one end to the motor and adapted to pivot the motor horizontally on the vertical pin to effect steering of the motor, and support means for said push-pull means mounted co-axially of said horizon-

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tal pin for free pivoting with said motor on the axis of said horizontal pin without interfering with the steering control of the motor.

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