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[15] **3,659,475**

[45] **May 2, 1972**

[54] **REMOTE THROTTLE AND STEERING CONTROL UNIT**

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115/18 R

[51] Int. Cl. G05g 13/00

[58] Field of Search 74/501, 471, 480 B, 494, 488,
74/489; 114/160; 115/18 R

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Primary Examiner—Milton Kaufman

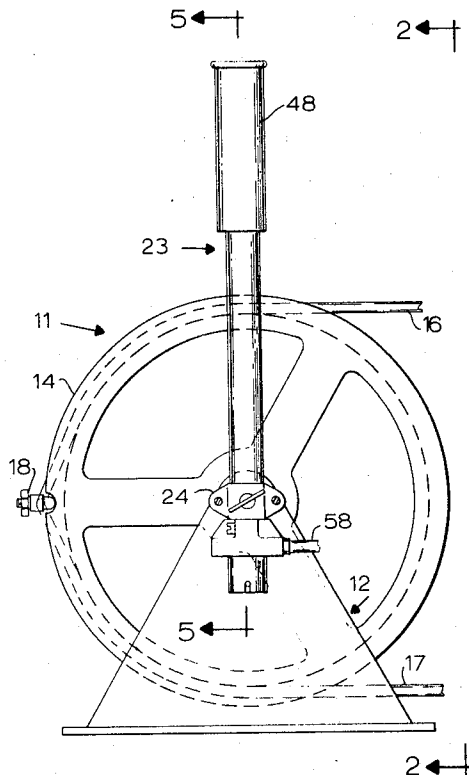
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[57] **ABSTRACT**

A remote control unit for an outboard motor or the like incorporating in a single control bar the combined functions of steering and throttle control.

2 Claims, 10 Drawing Figures



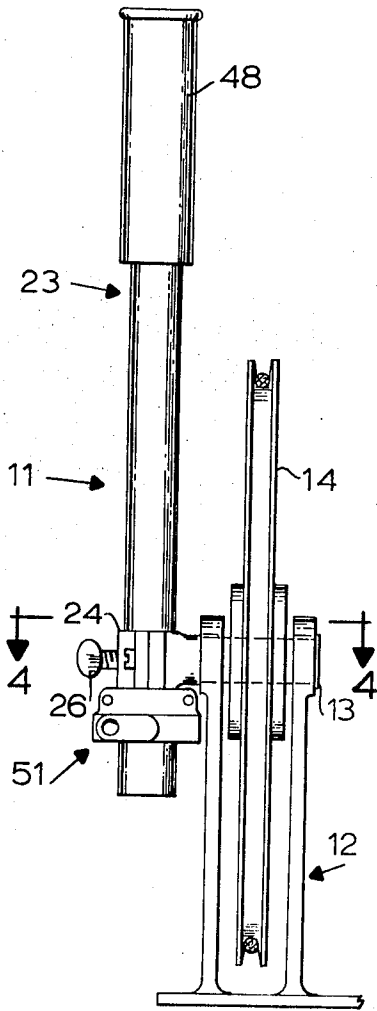


FIG. 2

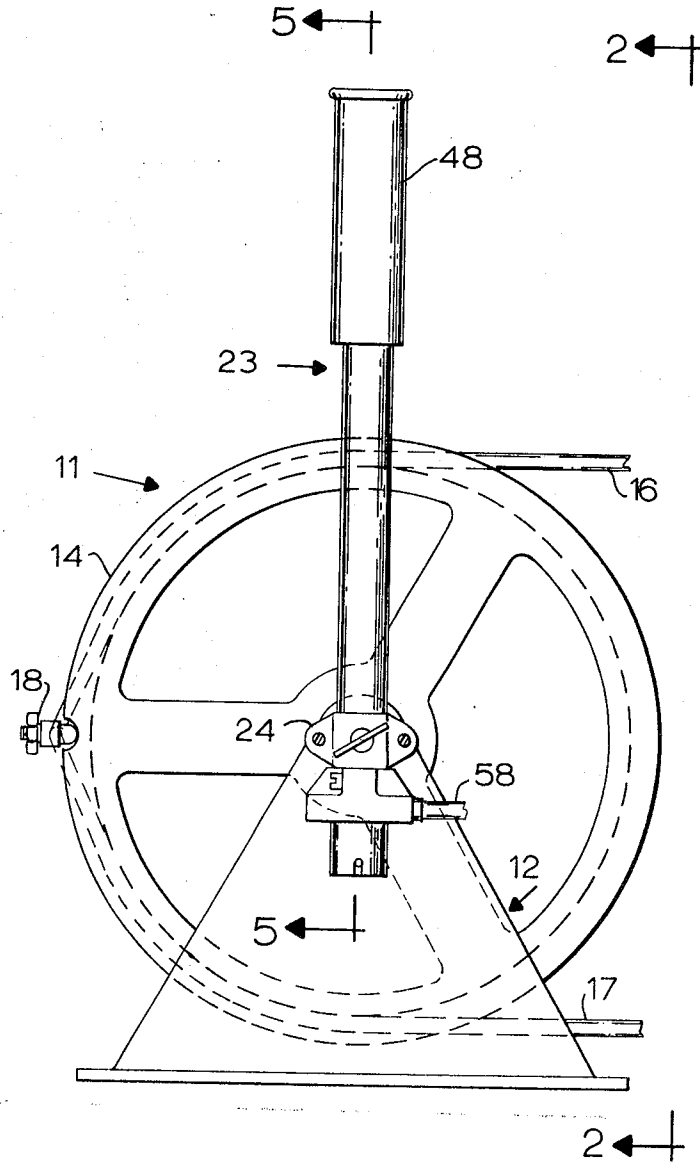


FIG. 1

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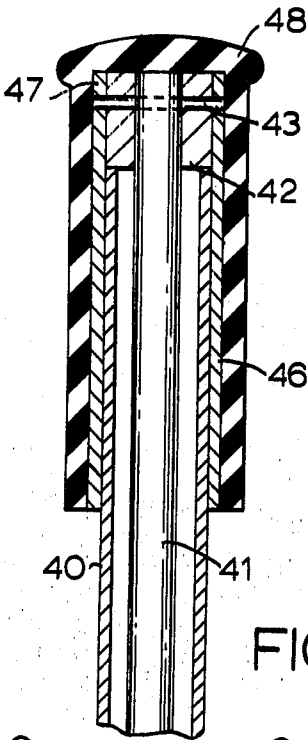


FIG. 5

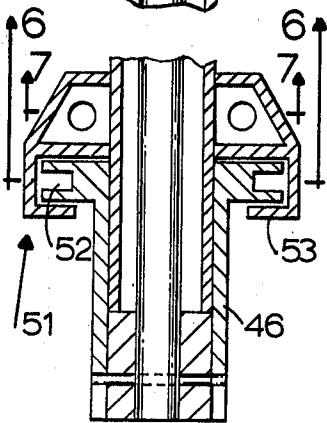


FIG. 6

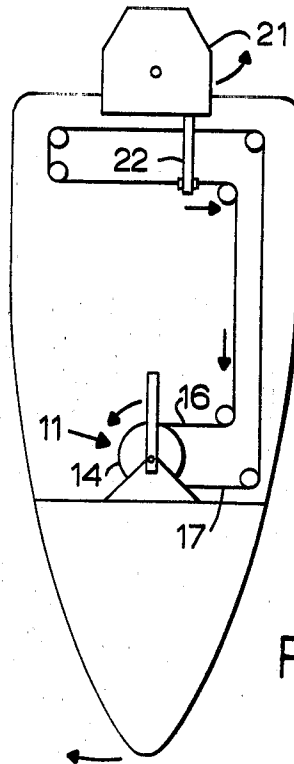


FIG. 3

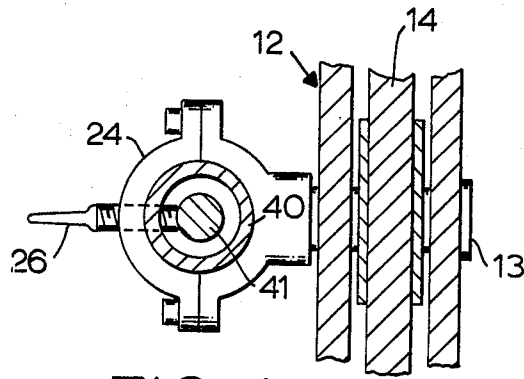


FIG. 4

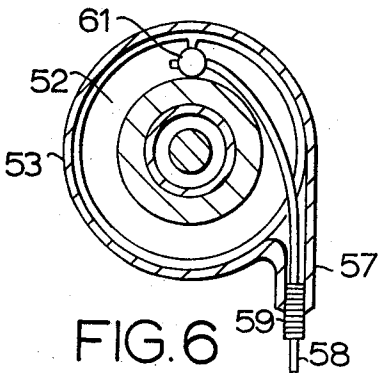
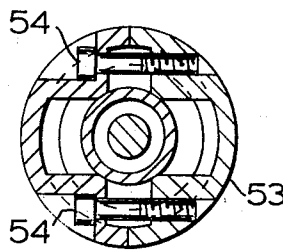


FIG. 7

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FIG. 8

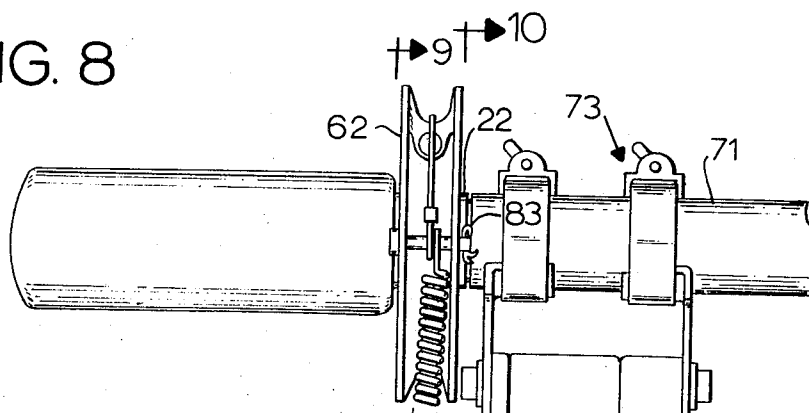
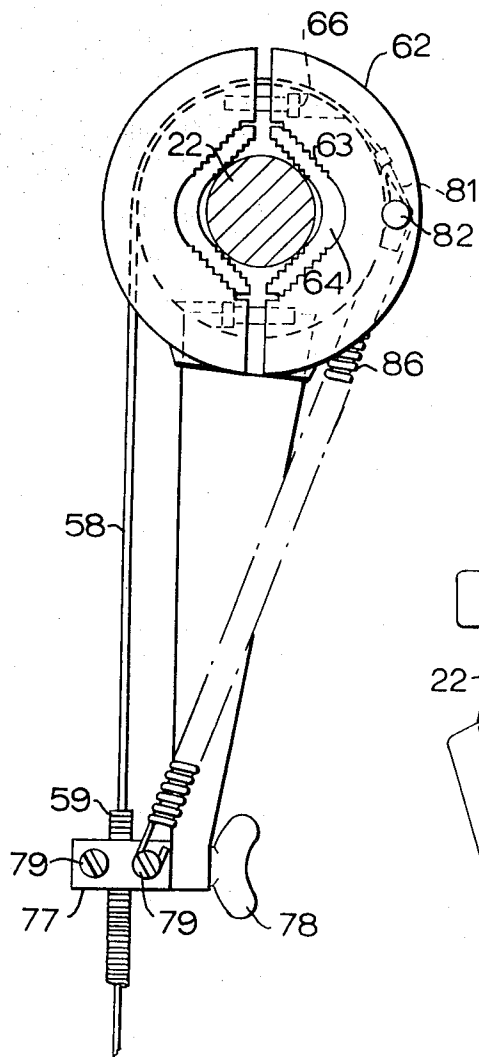


FIG. 9

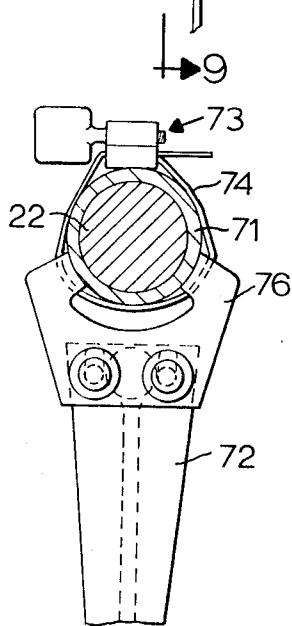


FIG. 10

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REMOTE THROTTLE AND STEERING CONTROL UNIT

BACKGROUND OF INVENTION

It is known to provide remote steering and throttle control for ships and boats, generally in a wheelhouse or control station thereof. Commonly, however, these types of controls are provided for vessels having integral drive means and with regard to the field of small boats such propulsion means are commonly termed inboard motors. There are, however, a large class of powered boats employing outboard motors, i.e., internal combustion engines, which may be removably attached to the transom of a boat for powering of same. In the operation of outboard motors, it is conventional for the operator to locate himself at the stern of the boat where the motor is mounted and to steer the boat by swinging the throttle or steering arm back-and-forth in an arc and to control the throttle setting by rotating the throttle bar or steering arm. It is realized, however, that for many applications, it is desirable for the operator to be located somewhere else in the boat other than the stern thereof, and thus there have been developed remote steering units and remote throttle controls for outboard motors of substantial horsepower. These types of remote controls commonly parallel those provided for inboard motors in that they usually incorporate a steering wheel connected by cables to the outboard motor and commonly provide a separate throttle lever that may be moved between positions along an arc to establish the desired throttle setting. Aside from the foregoing there exists a relatively large group of what may be termed small horsepower outboard motors which commonly must be manually operated from the stern of the boat because of the lack of remote steering and throttle control means therefor. Some boat operators have, in fact, attempted to provide home-made remote control units for this type of outboard motor in order to achieve remote control with a minimum of cost.

The present invention provides a simple inexpensive and yet highly utilitarian remote control unit particularly adapted for small outboard motors employed with boats. The control unit of the present invention provides the control in a single movable element to thus materially simplify both the structure and the operation of the invention.

SUMMARY OF INVENTION

There is provided by this invention a relatively simple system adapted for connection to an outboard motor that may be mounted on the stern of a small boat for propelling same. The unit hereof may be located at any desired position upon a boat carrying an outboard motor and provides for both throttle setting and steering in a single movable control bar or the like.

The control bar of the present invention is mounted to move in an arc under control of an operator in order to controllably swing the throttle bar of an outboard motor or the like so as to direct the rudder and propeller thereof in a desired direction for steering a boat upon which the outboard motor is mounted. The control bar of this invention is furthermore provided with a capability of being rotated about the axis thereof and this rotary motion is coupled by a flexible cable of the type employed for motorcycles and the like to the throttle bar of the outboard motor for operating same to consequently vary the throttle setting of the motor.

The throttle and steering control mechanism of the present invention is adapted for permanent mounting within a boat and for simple attachment to and disconnection from an outboard motor that may be removably mounted upon the stern of the boat. The control bar of the present invention is attached to a pulley wheel having flexible cables extending therefrom about appropriate guide members to the stern of the boat for removable attachment to the throttle bar of an outboard motor. Thus, moving the control bar in an arc moves the throttle bar of the outboard motor in an arc to provide steering control. Furthermore, the control bar of the present invention includes an axial torque bar for transmitting rotary

motion from a control bar handle at one end of the bar to a throttle pulley wheel immediately adjacent the axis of the above-noted steering pulley wheel. A Bowden cable extending from the throttle pulley wheel at the remote control station is connected to the throttle bar of the outboard motor by bracket and spring means to provide for twisting of the throttle bar by the control bar so as to provide continuous throttle setting.

DESCRIPTION OF FIGURES

A single preferred embodiment of the present invention is illustrated in the accompanying drawings, wherein:

FIG. 1 is a plan view of the remote control mechanism of the present invention;

FIG. 2 is a side elevational view of the mechanism of FIG. 1;

FIG. 3 is a schematic illustration of steering control lines between the remote control mechanism and an outboard motor;

FIG. 4 is a sectional view taken in the plane 4—4 of FIG. 2;

FIG. 5 is a partial enlarged sectional view taken in an axial plane of the control bar of the remote control mechanism of FIG. 1;

FIG. 6 is a transverse sectional view taken in the plane 6—6 of FIG. 5;

FIG. 7 is a transverse sectional view taken in the plane 7—7 of FIG. 5;

FIG. 8 is a side elevational view of the throttle control connection to an outboard motor;

FIG. 9 is a transverse sectional view of the throttle control connection at the motor taken in the plane 9—9 of FIG. 8; and

FIG. 10 is a partial transverse sectional view taken in the plane 10—10 of FIG. 8.

DESCRIPTION OF PREFERRED EMBODIMENT

The remote control unit 11 illustrated in FIGS. 1 and 2, will be seen to include a mounting bracket 12 which may be secured to any desired portion of a boat or the like, such as the forward combing and including a pair of spaced sides adapted to carry an axle 13 therethrough. A peripherally grooved pulley wheel 14 is mounted on the axle 13 for rotation in the mounting bracket 12. A pair of lines or cables 16 and 17 extend partially about opposite sides of the pulley wheel 14 in the peripheral groove to a connector 18 which engages the pulley wheel as, for example, by lateral arms extending from the sides thereof to fix the cable ends with respect to the wheel. It will be seen that turning the wheel 14 will cause one of the cables to wrap further around the wheel and the other cable to unwrap as the cable ends and the connector 18 are moved. This, then, provides for remote steering of an outboard motor, for example.

Referring to FIG. 3, there is schematically illustrated the pulley wheel 14 with cables 16 and 17 extending therefrom and located at some distance from an outboard motor 21. The cables 16 and 17 are shown to be directed about small pulleys or the like from the remote control unit 11 to the outboard motor where the two cables are connected to opposite sides of the throttle bar 22 of the motor which includes a shaft rotatable in the usual manner about its axis to control throttle setting. Thus the motor may be pivoted for steering from the remote control unit 11 by means of the cables 16 and 17, and the throttle setting is controlled by turning the rotatable shaft of the throttle bar 22 about its axis.

With regard to the manner of turning the pulley wheel 14 for steering, there is shown in FIGS. 1 and 2 a control bar 23 affixed to one end of the axle 13 by a split fitting 24 bolted about the bar 23 as shown. The control bar may then be moved in an arc to rotate the pulley wheel 14 and consequently to rotate the outboard motor 21 for steering the boat.

The control bar 23 is also employed for adjusting the throttle setting of the motor 21. Considering now the details of the control bar 23 and referring to FIGS. 5, 6 and 7, it will be seen

that the bar includes an outer cylindrical tube 40 with an elongated torque tube or rod 41 disposed axially therethrough with a cylindrical spacer 42 connected at each end of the torque tube by means of a pin 43 extending through tube and spacer. These spacers 42 are disposed about the torque tube at opposite ends of the tube or cylinder 40. At each end of the tube 40 there is provided a cylindrical sleeve 46 slipped over the tube ends and over the spacers 42 so as to be rotatable thereabout. Each of the sleeves has slots 47 formed in extension inwardly from the ends thereof and the pins 43 extend into these slots. It will thus be seen that the sleeve 46 is locked to the torque bar or tube 41 and, inasmuch as the sleeve is rotatable on the outer tube 40, rotation or twisting of one sleeve 46 will thus result in similar rotation of the other sleeve. A rubber or plastic grip 48 is provided over the cylinder or sleeve 46 and attached thereto so that an operator may readily grip the control bar both for swinging the same in an arc to steer and for twisting same to control throttle setting.

On the opposite side of the mounting bracket or fitting 24 from the handle 48, there is provided a cable connection 51 to the control bar. This connection includes a pulley wheel or drum 52 disposed about the sleeve 46 in attachment thereto and a housing 53 over the drum. The housing is formed as two mating halves that are placed together about the sleeve 46 and tightened in position by means of bolts 54, as illustrated in FIG. 7. The housing 53 extends about the pulley wheel or drum 52 with openings for access to the bolt heads and includes a depending hollow cylindrical projection 57 through which a cable 58 of a Bowden cable is adapted to pass for engagement with the drum 52. This throttle cable 58 may be of the general type employed as a speedometer cable or the like, wherein an outer sheath or casing 59 of such Bowden cable surrounds the cable 58 so that the cable itself is free to move within the sheath. At the end of the cable 58 there is provided a fitting 61 as, for example, in the form of a short cylinder secured to the cable end for the purpose of attachment of the cable to the drum 52. This attachment may be accomplished by the provision of corresponding circular openings through the sides of the pulley wheel with a slot extending from these openings to the wheel periphery. The fitting may thus be slipped laterally into the wheel openings with the cable then lying about the wheel hub as shown in FIG. 6 and extending through the housing 57.

It will be seen that with the structure described and illustrated turning of the handle 48 will rotate the pulley wheel or drum 52 to thus wind or unwind the cable thereabout.

Considering now the attachment of the throttle control of the present invention to an outboard motor 21, it is noted that a conventional outboard motor is normally provided with a throttle bar 22 which may be rotated about its axis to vary the throttle setting of the motor. The present invention operates to produce this rotary motion of the throttle bar from the remotely located control bar 23 of the invention. To this end there is provided a split pulley wheel 62 having a somewhat rectangular shaft opening with serrations 63 formed along at least part of the inner surface of the opening. Spacers 64, also having serrations along the inner surfaces thereof, may be provided for the purpose of accommodating attachment of the pulley to different sized throttle bars on different outboard motors. In assembly the split pulley wheel 62 is placed about the throttle bar 22 with or without one or more spacers 64 as may be required, and is clamped to the bar 22 by means of bolts 66 extending from one wheel half into threaded engagement with the other, as shown in FIG. 9. The throttle control assembly is adapted to provide a "Dead Man" throttle which returns the throttle control to idle or shut-off position when released.

The throttle bar 22 is in fact comprised as a central rotatable bar or the like extending from a cylindrical housing 71 and having, for example, a twist grip on the end thereof for normal outboard motor operation. In accordance with the present invention, this twist grip is either removed from the throttle bar and the above-noted pulley wheel 62 is secured to the end of

the rotatable throttle bar, or it is possible to attach the pulley wheel about the twist grip itself or between the housing and grip, as shown. As briefly noted above, the present invention provides for returning the throttle to an idle or shut-off position when the throttle control mechanism of the present invention is released. This is herein accomplished by the provision of a bracket 72 which is mounted upon the throttle bar housing 71 and which depends therefrom. As shown in FIG. 8, this bracket 72 extends downwardly beneath the throttle bar housing 71 and is mounted thereon as by means of one or more clamps 73 which may include depending plates bolted to the top of the bracket. An individual clamp, such as shown in FIG. 10, may, for example, comprise a flexible strip of laterally slotted metal 74 extending about upper lateral projections of a mounting plate 76 and having a thumbscrew in threaded engagement for tightening the strip or the like 74 about the housing, somewhat in the manner of a hose clamp. Alternatively, other types of mounting means may be employed.

At the lower end of the bracket 72 there is provided a split mounting block 77 with the two portions thereof defining the vertical aperture therethrough. This block 77 is attached to the bracket by a thumbscrew 78 extending through the bottom of the bracket and threaded into one side of a mounting block. A pair of bolts 79 extend from the exterior of the mounting block through the outer portion thereof into threaded engagement with the inner portion adjacent the bracket 72, as generally illustrated in FIGS. 9 and 10. The cable 58 is placed between the portions of the mounting block 77 and the mounting block bolts 79 are then tightened to grip the cable casing or sheath 59. The end of the cable 58 beyond the sheath is extended about the pulley wheel 62 and has the end thereof formed as a loop, as indicated at 81 of FIG. 9. A transverse pin 82 is extended through the side flanges of the pulley wheel with a head on one end of the pin exteriorly of the wheel. This pin extends through the loop 81 on the end of the cable and a cotter pin 83 extends through the opposite end of the pin 82 to maintain such pin in recited position.

With the above-described structure it will be seen that drawing of the cable 58 downwardly in FIG. 9 will serve to rotate the throttle shaft 22 in a counterclockwise direction, which in this illustration is intended to increase the throttle setting, i.e., speed up the motor. An elongated spiral return spring 86 has one end thereof looped about the pin 82 of the pulley wheel and the other end looped about a convenient location at the bottom of the bracket such as, for example, the head of one of the bolts 79 of the mounting block 77. This spring is maintained in tension so as to thus at all times tend to rotate the pulley wheel and thus the attached throttle shaft 22 in a clockwise direction for returning the throttle setting to either idle or shut-off.

It will be seen that, with the throttle control cable 58 extending from the wheel 62 to the connector 51 at the control bar 23, twisting of the control bar at the handle thereof will twist or rotate the throttle bar of the motor so as to change the throttle setting. If desired, the thumbscrew 26 of the remote control unit may extend through the outer tube 40 of the control bar so that it may then be tightened against the torque tube 41. The thumbscrew thus holds the throttle setting as adjusted by the control bar, for otherwise the return spring 86 at the motor will cut off the motor by rotating the throttle bar of the motor to idle or shut-off position. Under those circumstances where it may be desirable to cruise at a set speed with unvarying throttle setting, the thumbscrew or friction screw may then be tightened against the torque tube to hold the setting.

Considering now the operation of the present invention and referring again to the drawings, it is noted that the mounting bracket 12 may be secured to any desired portion on a boat or the like with which the present invention is intended to be employed. It is also noted that the bracket may be mounted in horizontal or vertical position or, in fact, any desired position on the boat. The length and traverse of the steering cables 16

and 17 are established so that there is no slack in the cables and preferably the throttle control cable 58 is retained in its desired path from the remote control unit 11 to the motor 21 by small clips which may, for example, be secured under the deck or elsewhere. With regard to the attachment of the steering cables 16 and 17 to the outboard motor, it is noted that a clamp, for example, may be secured about the cylindrical housing 71 of the throttle bar 22 at some desired position such as, for example, between the two mounting brackets 73 on the housing.

Steering is readily accomplished with the present invention merely by moving the control bar 23 in an arc, i.e., to left and right of the position illustrated in FIG. 1, which is normally established as a straight ahead rudder position. The cables 16 and 17 may be directed somewhat as indicated in FIG. 3 or, alternatively, may be crossed over so as to reverse the direction of rudder turning for control bar movement.

In order for an operator to change the throttle setting of the motor 21, it is only necessary for him to twist the control bar handle 48 so as to thus draw the cable 58 toward the remote control station and consequently to rotate the throttle bar 22 of the motor. With the connections as shown in the drawings, release of the handle 48 will then allow the motor to be automatically returned to an idle or stop position. Provision is made for maintaining any desired throttle setting by means of a thumbscrew 26 threaded through the fitting 24 and extending laterally through the tube 40 of the control bar 23. This thumbscrew may be tightened to bear upon the torque bar 41 and thus hold it in any adjusted rotary position. Retraction of the thumbscrew releases the torque tube to return the "Dead Man" throttle control. It is noted that, although the connector 51 is mounted below the axle 13, angular movement of the control bar to effect steering does not affect the throttle setting inasmuch as both cable and sheath would then flex. Throttle control is referenced to the connector 51 and is only relative longitudinal movement of the cable 58 with regard to the housing or sheath 59 thereof that operates the throttle bar of the motor.

It will be seen from the foregoing that there is provided by the present invention a simple and yet utilitarian remote control device for outboard motors to the end of providing for steering of the boat by the motor and controlling the throttle

setting of the motor. The present invention employs but a single control bar for both of the above-noted functions and this is highly advantageous inasmuch as it requires the use of but one hand of an operator. Both steering and throttle control are quite easily accomplished with the present invention. Furthermore, the invention may be relatively easily attached to and disengaged from an outboard motor to thus further commend the invention to widespread applicability.

Although the present invention has been described with respect to a single preferred embodiment thereof, it will be appreciated that modifications and variations are possible within the scope of the invention.

What is claimed is:

1. A remote throttle steering control unit for an outboard motor comprising a pulley wheel adapted for mounting on a boat for controlled rotation, a pair of cables connected to said pulley wheel in extension from opposite sides thereof and adapted to be secured to opposite sides of the throttle bar of an outboard motor which includes a shaft rotatable about its axis to control throttle setting of the motor and which is also angularly displaceable in an arc for steering whereby turning of said pulley wheel effects such steering, a steering control connected to said pulley wheel for turning the same and including a tube and a torque shaft extending through the tube, a handle adjacent one end of the steering control for turning the torque shaft, a Bowden cable connection with the opposite end of the steering control comprising a cable element and a sheath, one end of the cable element being connected to turn with the torque shaft with the sheath connected to the tube, and mounting means connecting the opposite end of said Bowden cable to said throttle bar; said mounting means including a connection of the opposite end of cable sheath with a non-rotatable bracket of the throttle bar with the opposite end of the cable element connected to said throttle bar shaft to rotate the same upon turning of said handle, whereby the motor can be steered without affecting the throttle setting.

2. The remote control unit of claim 1 wherein said mounting means comprises a tube through which the rotatable throttle shaft extends, the non-rotatable bracket is carried by said tube, and a pulley is secured to said throttle bar shaft adjacent said bracket to which the cable element is connected.

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