Sept. 21, 1965 E. R. NOLEN 3,207,117

OUTBOARD MOTOR STEERING ASSEMBLY

Filed Aug. 25, 1964 2 Sheets-Sheet 1

Fig. 1

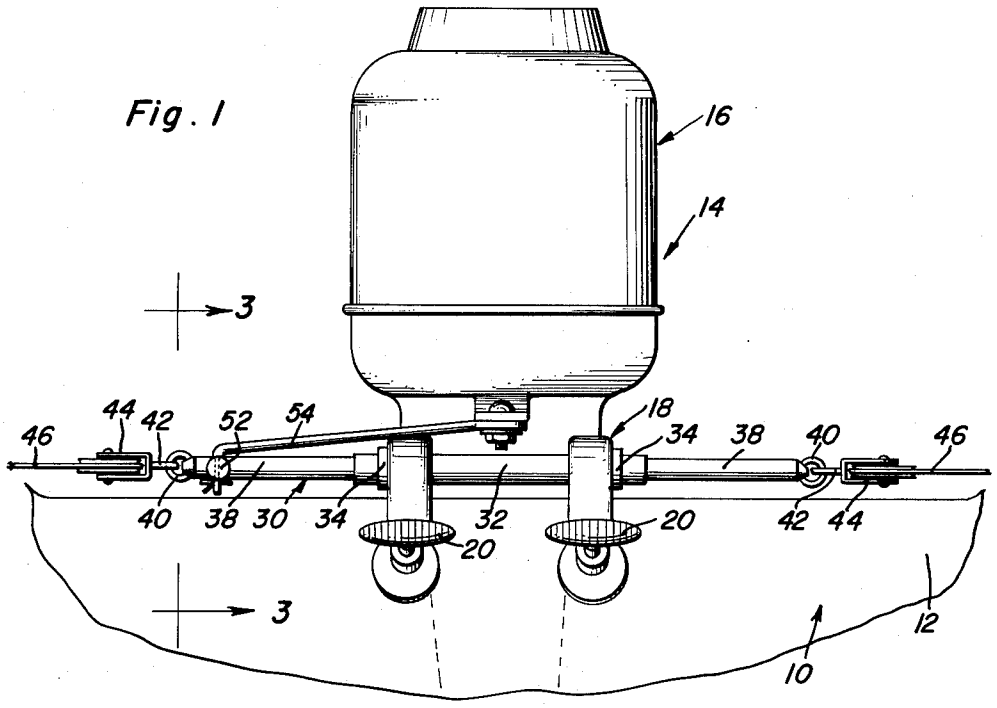

Fig. 2

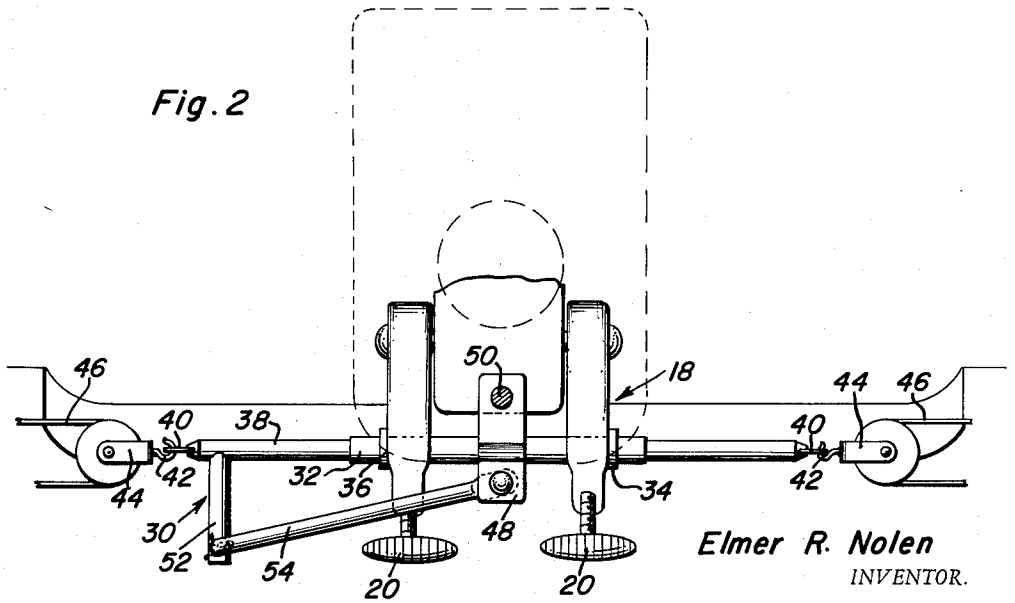

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Fig. 3

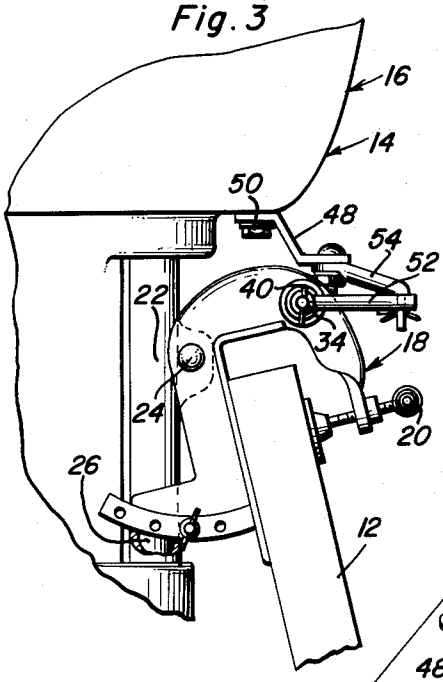


Fig. 4

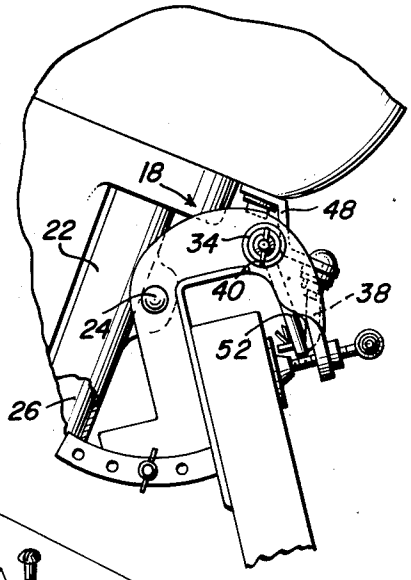


Fig. 5

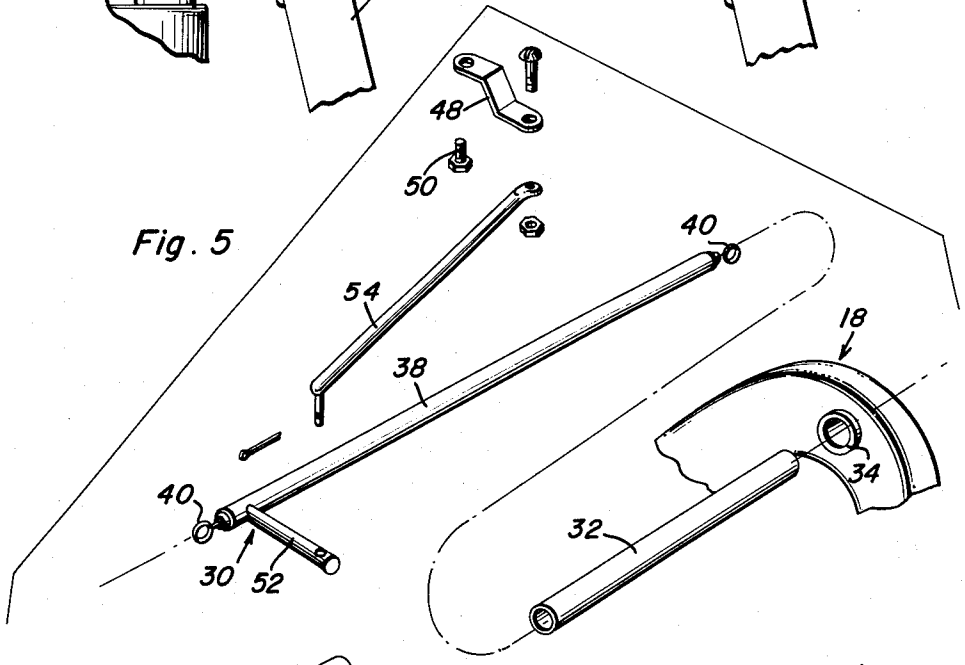
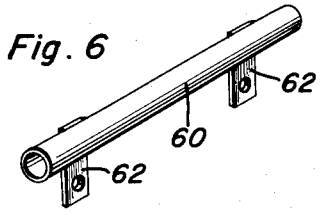


Fig. 6



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3,207,177

OUTBOARD MOTOR STEERING ASSEMBLY

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6 Claims. (Cl. 115—18)

This invention relates to a novel and useful outboard motor steering assembly and more specifically to an improved apparatus designed specifically for the purpose of steering an outboard motor.

There are several types of outboard motor steering assemblies presently being used such as those employing a pinion and rack gear assembly at the steering wheel with cables interconnecting the rack gear and the outboard motor, the more popular type utilizing cables wound about a drum mounted on the steering wheel shaft and connected to the outboard motor, and those utilizing a Bowden cable type of connection between the outboard motor and the steering wheel.

Most of these presently used outboard motor steering assemblies require the use of cables for the final connection of the steering assembly with the outboard motor. Inasmuch as the outboard motor is oscillated about an upstanding axis and positionable about a horizontal axis, these presently utilized outboard motor steering assemblies result in slack occurring in the cables utilized to ultimately connect the steering assemblies to the outboard motor at certain positions of rotation of the outboard motor about its upstanding pivotal axis due to the fact that the point of connection of the cables to the outboard motor shifts longitudinally of the centerline of the associated boat when the outboard motor is oscillated about its upstanding axis of rotation as well as vertically with respect to a horizontal plane when the fore-and-aft tilt of the outboard motor is adjusted. In order to overcome this inherent formation of slack in the control cables, the steering cables are passed about pulleys supported from the outboard motor and secured at their free ends to the boat hull by means of special spring assemblies.

Not only does the use of additional pulleys and special spring assemblies increase the cost of these conventional types of outboard motor steering assemblies, but these additional components also tend to rattle and vibrate during operation of the outboard motor and therefore are the cause of additional annonying noise. Still further, inasmuch as the control cables of conventional types of steering assemblies are anchored to the boat at their rear ends by means of special spring assemblies, there is necessarily an appreciable amount of lost motion which occurs between the steering wheel and the outboard motor especially if the frictional drag on the vertical pivot axis of the outboard motor is appreciable as is conventional. While some outboard motors are provided with means whereby this frictional drag may be adjusted, most boat owners maintain this adjustment in a condition such that a heavy drag is provided in order to minimize oscillation of the outboard motor about its vertical axis independent of rotation of the steering wheel during movement of the boat over rough water.

It is the main object of this invention to provide an improved outboard motor steering assembly constructed in a manner whereby conventional steering cables may be utilized and yet in a manner such that the final connection of the improved outboard motor steering assembly is accomplished by a positive connection between the outboard motor and a horizontally and transversely reciprocal member guided for straight line movement to which the flexible control cables are secured. In this manner, the advantages of utilizing flexible control cables

may be realized without also being forced to accept the disadvantages of utilizing a spring-controlled lost motion connection between the flexible steering cables and the outboard motor.

Another object of this invention is to provide an improved outboard motor steering assembly which may be readily adapted for use on substantially all boats and in connection with substantially all types of outboard motors.

Still another object of this invention is to provide an improved outboard motor steering assembly in accordance with the preceding objects including structural features which may be readily built into existing types of outboard motors during their manufacture.

A final object of this invention to be specifically enumerated herein is to provide an improved outboard motor steering assembly in accordance with the preceding objects which will conform to conventional forms of manufacture, be of simple construction and easy to use so as to provide a device that will be economically feasible, long lasting and relatively trouble free in operation.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a front elevational view of a fragmentary portion of a boat transom to which a conventional outboard motor is secured, the outboard motor steering assembly being illustrated operatively connected between the boat and the outboard motor;

FIGURE 2 is a top plan view of the assembly illustrated in FIGURE 1;

FIGURE 3 is a fragmentary side elevational view of the assembly illustrated in FIGURE 1 and as seen from the left side thereof;

FIGURE 4 is a fragmentary side elevational view similar to that of FIGURE 3 but showing the outboard motor in a tilted position and the various components of the improved steering assembly of the instant invention in corresponding positions;

FIGURE 5 is an exploded perspective view of the outboard motor steering assembly of the instant invention clearly illustrating the simplicity of its structural components; and

FIGURE 6 is a perspective view of a modified form of one component of the outboard motor steering assembly of the instant invention.

Referring now more specifically to the drawings, the numeral **10** generally designates a boat including a transom **12** to which an outboard motor generally referred to by the reference numeral **14** is secured. The outboard motor **14** includes a power head assembly generally referred to by the reference numeral **16** and a double C-clamp mounting bracket generally referred to by the reference numeral **18**. The mounting bracket **18** is secured to the transom **12** in the conventional manner by means of the clamp screws **20** thereof and a support bracket **22** is pivotally supported from the mounting bracket **18** by means of a horizontal pivot pin **24** extending transversely of the boat hull **10** and generally paralleling the transom **12**. The power head assembly **16** is pivotally supported from the support bracket **22** by means of a pivot shaft **26** and it may therefore be seen that the power head assembly **16** may be pivoted about an upstanding axis relative to the support bracket **22** and about a horizontal axis relative to the mounting bracket **18**.

With attention now invited to FIGURES 1, 2 and 5 of the drawings, it may be seen that the outboard motor

steering assembly of the instant invention is generally referred to by the reference numeral **30**. The assembly **30** includes a tubular support **32** which is passed through a pair of aligned sleeves **34** and **36** secured in the double C-clamp **18** which comprises the mounting bracket. An elongated control member **38** is telescopically received through the tubular support **32** and is also rotatable about its longitudinal axis relative to the tubular support **32**. The opposite end portions of the control member **38** have eye members **40** secured thereto and a pair of mounting swivel hooks **42** supported from a pair of pulley assemblies **44** are engaged with the eye members **40**. A pair of control cables **46** are entrained about the pulley assemblies **44** and it is to be understood that one end of each control cable **46** may be fixedly secured to the boat **10** while the other ends of the cables **46** may be secured to a suitable winding drum (not shown) supported from the steering wheel shaft (not shown) of the boat **10**.

A steering arm **48** is secured to the power head assembly **16** at one end by means of a suitable fastener **50** and the other end of the steering arm **48** projects forwardly of the power head assembly **16**. One end portion of the control member **38** includes a forwardly directed control arm **52** and a connecting arm **54** has its opposite ends pivotally secured to the free end of the control arm **52** and the steering arm **48** for rotation about axes disposed normal to the pivot pin **24**.

It may be seen that longitudinal reciprocation of the control member **38** will effect positive oscillation of the power head assembly **16** about its axis of rotation defined by the pivot shaft **26**. In addition, should it be necessary to pivot the support bracket **22** relative to the mounting bracket **18** about the axis defined by the pivot pin **24**, swinging movement of the steering arm **48** about the axis defined by the pivot pin **24** will effect similar swinging movement of the control arm **52**. Thus, it may be seen that a positive connection between the steering arm and the control member **38** is maintained throughout pivotal movement of the power head assembly **16** relative to the mounting bracket **18**.

Inasmuch as there is no need for securing the free ends of the cables **46** to the boat **10** by means of special spring assemblies, a connection between the steering wheel (not shown) to which the steering cables **46** are secured and the control member **38** with very little lost motion between the steering arm and the steering wheel is afforded.

With attention now directed more specifically to FIGURE 6 of the drawings there may be seen a modified form of tubular support referred to by the reference numeral **60** and including a pair of mounting brackets **62** adapted to be fixedly secured to the forward surface of the transom **12** in any convenient manner such as by fasteners secured through the mounting brackets **62**. When the tubular support **60** is utilized, the control member **38** is slidably and rotatably received therein in lieu of the tubular support **32**.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. In combination, an upstanding panel portion of a watercraft including front and rear sides, an upstanding outboard motor disposed to the rear of said panel portion and including a mounting bracket secured to said panel portion adjacent the upper edge thereof and a support bracket pivotally secured to said mounting bracket for rotation about a generally horizontal axis generally paralleling the medial plane of said panel portion, said outboard motor being pivotally supported from said support bracket for rotation about an axis generally normal to the first-mentioned axis, an outboard motor steering assembly including an elongated control member, means supporting said control member from said panel portion for guided rectilinear movement in a path generally paralleling said horizontal axis and for oscillation about its longitudinal axis, laterally projecting arm means carried by said control member, a control arm generally paralleling said control member and having its opposite ends pivotally secured to said motor and the free end portion of said arm means for rotation about axes disposed normal to the first-mentioned axis, and means carried by at least one end portion of said control member adapted to be operatively connected to a steering control.

2. The combination of claim **1** wherein said means supporting said control member is supported from the front side of said panel portion.

3. The combination of claim **1** wherein said means supporting said control member is supported from said mounting bracket.

4. The combination of claim **1** wherein said means supporting said control member comprises a tubular support slidably and rotatably receiving said control member therein and mounted on said panel portion.

5. The combination of claim **1** wherein said means supporting said control member comprises a tubular support slidably and rotatably receiving said control member therein and mounted on said mounting bracket.

6. In combination, an upstanding panel portion of a watercraft including front and rear sides, an upstanding outboard motor disposed to the rear of said panel portion and including a mounting bracket secured to said panel portion adjacent the upper edge thereof and a support bracket pivotally secured to said mounting bracket for rotation about a generally horizontal axis generally paralleling the medial plane of said panel portion, said outboard motor being pivotally supported from said support bracket for rotation about an axis generally normal to the first-mentioned axis, an outboard motor steering assembly including an elongated control member, means supporting said control member from said panel portion for guided rectilinear movement in a path generally paralleling said horizontal axis and for oscillation about its longitudinal axis, a control arm generally paralleling said control member and having its opposite ends pivotally supported from said motor and one end portion of said control member for rotation about axes disposed normal to the first-mentioned axis, and means carried by at least one end portion of said control member adapted to be operatively connected to a steering control.

No references cited.

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