

June 4, 1963

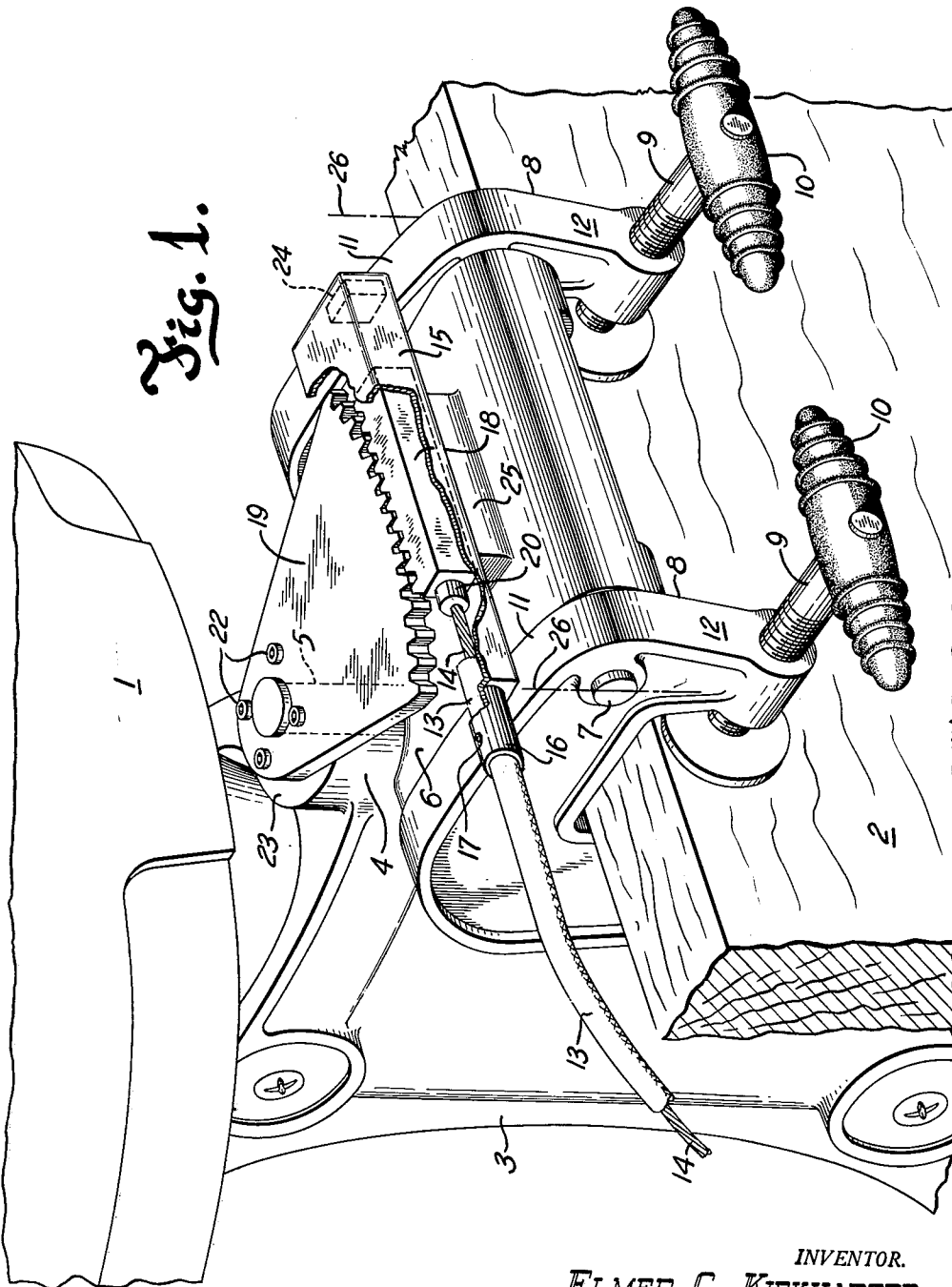
E. C. KIEKHAEFER

3,091,977

OUTBOARD MOTOR REMOTE STEERING CONTROL

Filed Oct. 21, 1959

2 Sheets-Sheet 1



INVENTOR.

ELMER C. KIEKHAEFER

BY

Andrew b. Starke
Attorneys

June 4, 1963

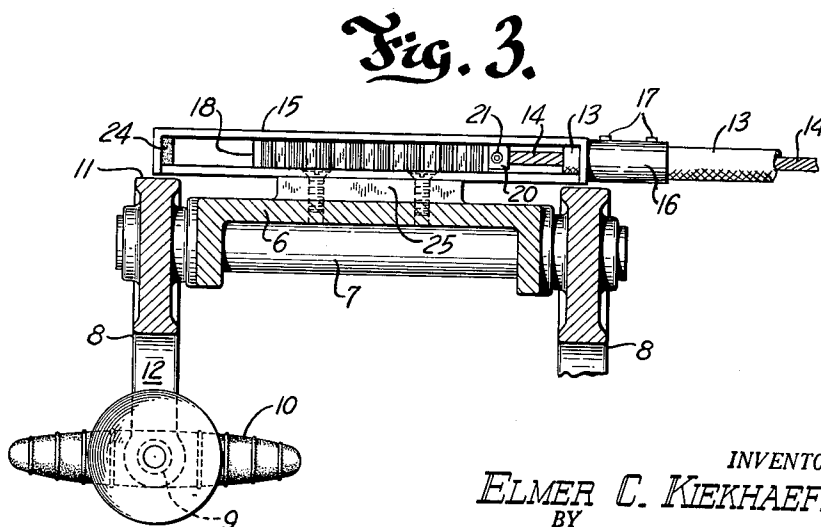
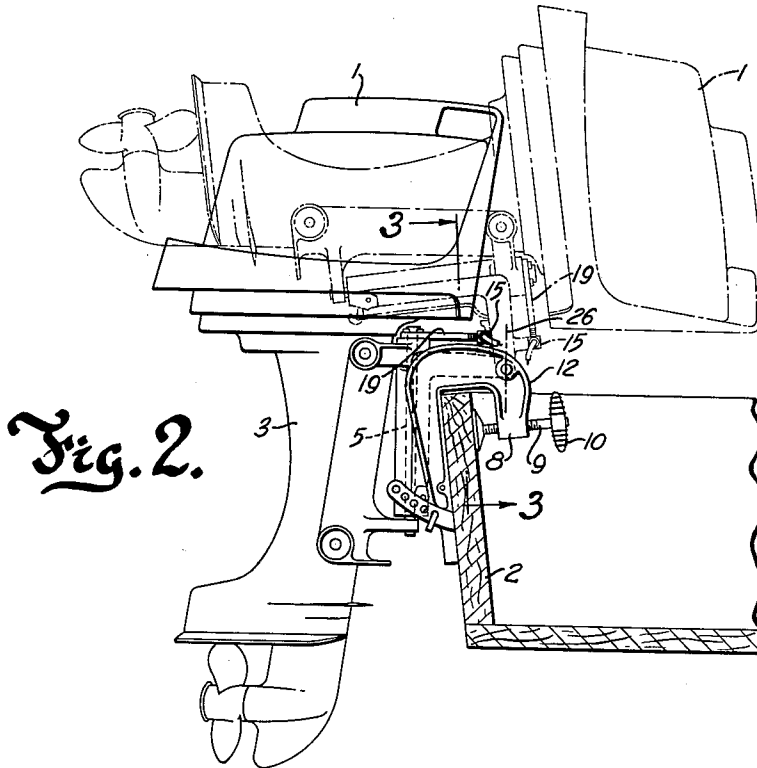
E. C. KIEKHAEFER

3,091,977

OUTBOARD MOTOR REMOTE STEERING CONTROL

Filed Oct. 21, 1959

2 Sheets-Sheet 2



INVENTOR.
ELMER C. KIEKHAEFER
BY
Andrus & Starke
Attorneys

1

3,091,977

OUTBOARD MOTOR REMOTE STEERING CONTROL

Elmer C. Kiekhaefer, Cedarburg, Wis., assignor, by mesne assignments, to Kiekhaefer Corporation, Chicago, Ill., a corporation of Delaware

Filed Oct. 21, 1959, Ser. No. 847,722

1 Claim. (Cl. 74-501)

This invention relates to an outboard motor remote steering control, and more particularly to an improved control which is mounted on the tilt bracket of an outboard motor.

It has been found by the present inventor that in many instances it is desirable to utilize a push-pull type cable which connects the steering wheel at the bow of a boat with the outboard motor mounted at the stern.

The present invention provides a novel steering control whereby a push-pull type cable may be feasibly used without danger of interference when the motor is tilted.

The accompanying drawings illustrate the best mode presently contemplated by the inventor for carrying out the invention.

In the drawings:

FIGURE 1 is a fragmentary perspective view of apparatus constructed in accordance with the present invention;

FIG. 2 is a side elevation of the apparatus in operating position, and showing in phantom lines the position when the outboard motor is tilted at 90° from its operating position; and

FIG. 3 is a transverse vertical section taken on line 3-3 of FIGURE 2, with the sector gear removed for clarity.

As shown in the drawings, the apparatus is designed for use in an outboard motor 1 mounted on the transom 2 of a boat. The power unit 3 of the motor is pendantly and dirigibly supported from transom 2 by a pivot or swivel bracket 4 which supports the motor on a generally vertically extending swivel pin 5 whereby unit 3 is adapted for horizontal pivotal steering movement.

A tilt bracket 6 supports the vertical swivel pin 5 and is in turn pivotally mounted for tilting upon a horizontal pin 7 carried by the clamp bracket 8. The clamp bracket 8 is secured to the boat transom by manually operable clamping screws 9 having handles 10 thereon and extending through the vertical portions 12 of the side arms 11 of the clamp bracket.

The pin 7 is disposed forwardly of the transom and requires a general lifting of the motor as it tilts upwardly and forwardly thereon.

The steering control for the motor is actuated by a steering cable having an outer casing 13 and a push-pull member 14 which is disposed within the casing and movable axially therewithin. One end of the steering cable is connected to a remote steering wheel, not shown, in any suitable way, while the other end of the cable is mounted to approach motor 1 parallel to but spaced generally above pivot pin 7.

As best shown in FIGS. 1 and 3, the end of the steering cable is adapted to be inserted into a generally rectangular housing 15 which is closed except along the edge facing motor 1, for purposes to be described. A circular sleeve 16 extends from one end of housing 15.

Casing 13 is adapted to be inserted through sleeve 16 so that the casing extends inwardly a short distance into housing 15 and member 14 normally extends beyond the casing. Securement of casing 13 in the proper position is provided by a plurality of screws 17 which extend through sleeve 16 and are tightened to hold the casing but not restrict axial push-pull movement of member 14.

2

The steering linkage between the cable and motor 1 is provided by a rack 18 and sector gear 19 which meshes with the rack. As best shown in FIGURE 1, rack 18 is generally rectangular in transverse section and is slidably disposed in the forward half of housing 15. The teeth of rack 18 face rearwardly toward the open side of housing 15.

Connection between cable member 14 and rack 18 is made through a sleeve-like extension 20 on the end of rack 18 nearest sleeve 16. Member 14 fits within extension 20 and is secured thereto by a tightening screw 21 which faces in the same direction as the rack teeth, i.e.: toward the open side of housing 15. Placement of screw 21 in this manner permits easy access thereto by a screw driver through the open side.

The teeth of sector gear 19 are brought into engagement with the teeth of rack 18 by moving gear 19 horizontally forwardly through the open side of housing 15. The intermeshing portions of the teeth are disposed within housing 15 whereby the connection is protected from falling foreign matter.

The rear portion of sector gear 19 is fixedly mounted, as by bolts 22, to the top face 23 of the swivel bracket 4. Swivel pin 5 extends upwardly through mount 23 and gear 19 so that the latter pivots about pin 5 with the motor.

Actuation of push-pull member 14 at the bow of the boat will be transmitted to move rack 18 parallel to pin 7 to thereby pivot gear 19 and steeringly pivot motor 1 about pin 5.

Cushioning of one end of the stroke of rack 19 is provided by a rubber bumper 24 secured within the outer end of housing 16. The other end of the rack stroke is cushioned by the portion of cable casing 13 which extends into the housing. Severe jarring of motor 1 at the end limits of steering is thus eliminated.

Housing 15 is fixedly mounted, as by bolts, on an upward extension 25 on tilt bracket 6, so that when the power unit is in the generally vertical operating position, arm portions 11 will not interfere with housing 15 and the latter will be resting on or raised slightly above portions 11.

Rack 18 is thus mounted on tilt bracket 6 close to and parallel to the tilt axis 7 to provide a remote control steering mechanism that tilts with motor 1, as set forth in Post Patent 2,875,722. In the present instance the cable connection to the rack is located slightly offset from axis 7 and flexibility of the steering cable compensates for this when the motor tilts without interfering with the steering control.

When the outboard motor is tilted upwardly on pin 7 to a non-operating position approximately 90° from the operating position, it is imperative that housing 15 does not engage arm portions 12 or handles 10, lest damage to the steering mechanism result. It has been found that this danger can be eliminated by mounting housing 15 on bracket 6 so that it is disposed between a vertical plane 26 passing through the axis of pin 7, and the axis of pin 5 when the motor 1 is in operating position.

The apparatus of the invention provides a novel steering control for use with a push-pull cable, the control having ease of accessibility and assembly and providing freedom from interference during tilting on a horizontal axis.

Various modes of carrying out the invention are contemplated as being within the scope of the following claim particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

I claim:

An outboard motor comprising a swivel bracket carrying the motor unit, a tilt bracket carrying the swivel bracket on a vertical steering axis, a clamp bracket adapted to be secured to the transom of a boat and

3

carrying said tilt bracket for upward tilting of the motor pivotally on a horizontal tilt pin disposed transversely forward of the boat transom, a forwardly facing gear sector rigidly secured to said swivel bracket to turn with the motor upon the vertical steering axis in steering the motor, a rack meshing with said gear sector, means rigidly mounted on the top of said tilt bracket and supporting said rack for longitudinal reciprocation in a direction substantially parallel to said tilt axis, a push pull cable for actuating said rack to effect steering control of the motor and having a core member and an outer tubular sheath member reciprocable relative to each other, means to secure one of said cable members to said rack, and means to secure the other of said cable members to the rack supporting means whereby relative reciprocation of said cable members will actuate said rack, and said cable approaching said cable securing means in a

4

direction generally parallel to and adjacent said tilt pin whereby the cable flexes upon tilting of the motor on said tilt pin without interfering with the steering control of the motor.

References Cited in the file of this patent

UNITED STATES PATENTS

1,150,162	Arnold	Aug. 17, 1915
1,580,877	Barber	Apr. 13, 1926
2,118,209	Linthwaite	May 24, 1938
2,492,213	Eder et al.	Dec. 27, 1949
2,598,383	Holzhauser	May 27, 1952
2,875,722	Post	Mar. 3, 1959

FOREIGN PATENTS

955,799	France	July 4, 1949
---------	--------	--------------