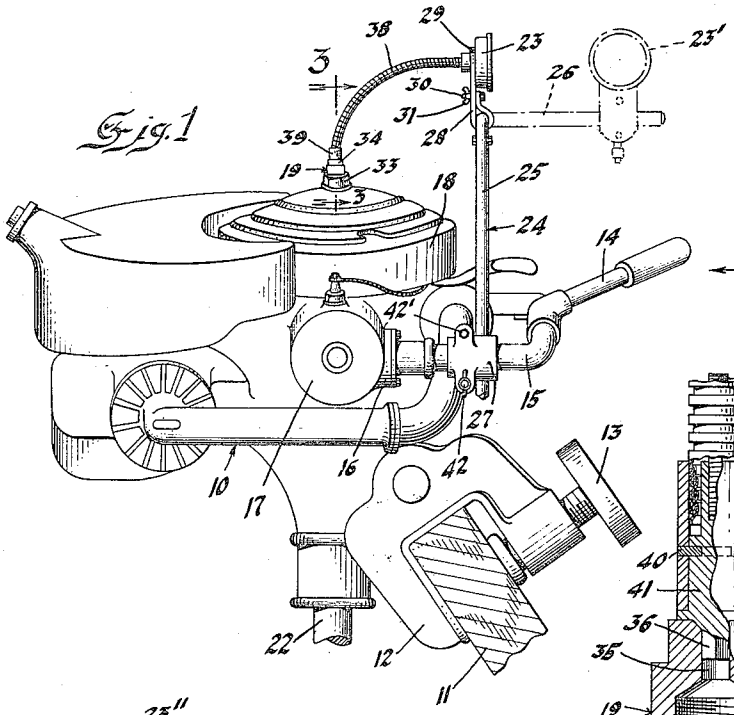
Dec. 10, 1929. G. W. HARRY 1,738,772

OUTBOARD MOTOR TACHOMETER ORGANIZATION

Filed Sept. 17, 1928

Fig. 1



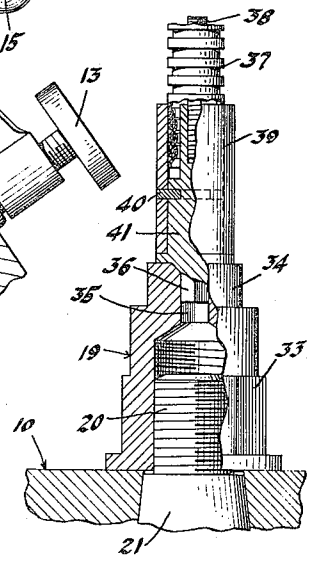


Fig. 3

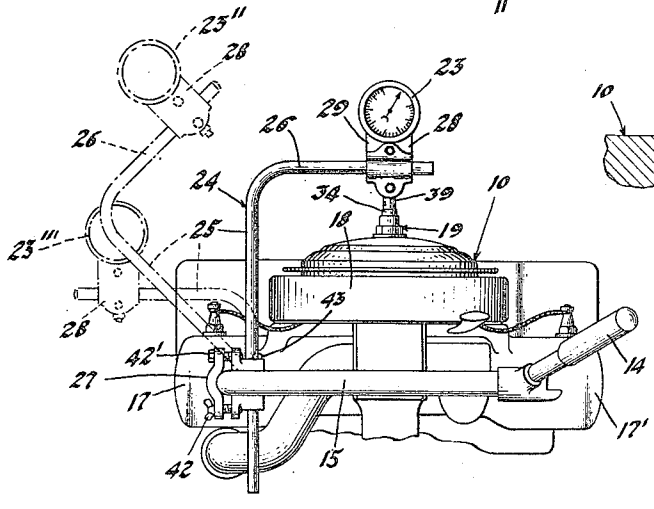


Fig. 2

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OUTBOARD-MOTOR TACHOMETER ORGANIZATION

Application filed September 17, 1928. Serial No. 306,355.

This invention relates to means for, or methods of, mounting tachometers, or the like, upon outboard motors which are so secured as to permit pivotal movement thereof,—as for steering; and it is accordingly a general object of this invention to provide simpler and more convenient means than have heretofore been available for observing the actual performance of movably mounted motors.

Outboard motors in current use may upwardly terminate in rotating parts, such as fly wheels; and preferred embodiments of this invention, necessitating no change either in indicating instruments or in outboard motors, may include substantially rigid but adjustable and shiftable means for supporting the non-rotary parts of tachometers or other speed-responsive instruments from some frame or other non-rotary part of a motor,—this supporting means being preferably used in conjunction with some flexible and/or readily disconnectible means of coupling rotatable parts of the tachometer, or equivalent instrument, with a rotary part, such as the crank shaft, of the outboard motor.

The problem of providing said means for indicating the rate of rotation of any shaft is obviously complicated (1) in proportion as provision is made for varying the direction in which said shaft may extend; and this problem is further complicated, in the case of an outboard motor, (2) by the fact that those parts whose rate is to be observed may rotate upon substantially vertical or upwardly extending axes, (3) by the fact that said rotary parts may be associated with or fixed on non-rotary parts at a level unfavorable to use of the latter to carry any instrument or instruments, and (4) by the fact that any connection between such a motor and a tachometer or equivalent instrument should be such as to permit of easy shifting and/or disconnection of said instrument,—as for the purpose of cranking the motor by means of a rope or for the purpose of any desired inspection or repair of parts.

Other objects of this invention, including a comparatively short flexible drive or connecting element which comprises a quick-detachable coupling device, and including means for so supporting a tachometer, or its equivalent, as normally to maintain a torque-transmitting connection between interengaging parts of said coupling device, and including also various features which enable the same tachometer organization to be used with motors differing in size or design, may be best appreciated from the following description of an illustrative embodiment of said invention, taken in connection with the appended claims and the accompanying drawings.

Fig. 1 may be referred to as a side perspective view, with parts broken away.

Fig. 2 is a partial elevational view taken in the general direction indicated by the arrow 2 of Fig. 1.

Fig. 3 is a detail sectional view, on an enlarged scale, taken substantially as indicated by the line 3—3 of Fig. 1.

Referring to details of that embodiment of the present invention chosen for purposes of illustration, an outboard motor 10 is shown as secured to a tail board 11, no other part of the boat comprising this board being shown; and means such as a clamp comprising a jaw 12 and a hand wheel 13 may be employed to so secure the said motor to said tail board as to permit any desired relative movement therebetween,—as, by manipulation of a steering arm 14.

Although details of construction of the various rotary and non-rotary parts of the motor organization are comparatively immaterial to the present invention, it will be noted that the steering arm 14 is shown as rigidly connected with a U-frame 15, the inner ends of this frame being secured to bosses 16, provided upon oppositely-extending cylinders 17, 17′; and a fly wheel 18 is shown as surmounted by a special adapter or coupling nut 19,—threaded upon an upward extension 20 of a tapered terminal portion 21 of a crank shaft 22. In order to utilize a part of the U-frame 15, or an equivalent non-rotary part of the motor 10, in so supporting a tachometer 23, or its equivalent, as to render the latter responsive to variations in the rate of rotation of parts such as the fly wheel 18 and/or the shaft 22, at the same time permitting the said tachometer to be readily disconnected

or shifted to an out-of-the-way position, means such as a comparatively rigid bracket 24 may be employed in connection with a suitable flexible drive extending between said nut and rotatable parts of said tachometer.

The bracket 24 is shown as comprising a normally vertical arm 25 and a normally horizontal arm 26; it may be secured, as by means such as a clamp 27, to one of the parallel legs of the U-frame 15; and means such as an additional clamp 28, comprising a tachometer-carrying plate 29 and a bolt 30, shown as carrying a wing nut 31, may be employed rigidly but adjustably to secure the tachometer 23 in a desired position relatively to the arm 26,—the mentioned position being such as normally to maintain a driving connection or contact between interengaging parts of the mentioned flexible or other drive 32 extending between the nut 19 and the tachometer 23.

Assuming the motor 10 to have been originally provided, by the manufacturer thereof, with some nut adapted to secure the fly wheel 18 upon the crank shaft 22, or its equivalent, the nut 19, then assumed to be employed in replacement of the original nut so provided, may include not only an externally non-circular section 33, suitable for engagement by a wrench, but an internally non-circular section 34,—the latter being shown as provided with a "square" opening 35, adapted to receive a correspondingly non-circular terminal or coupling member 36, upon one end of a flexible drive cable 37, extending to the tachometer 23, to operate the indicating mechanism of the latter. The cable 37 is shown as protected by a tubing 38, terminating within a "bushing" 39, and the latter may be secured, by means such as a retainer 40, to a bearing body 41,—with which the non-circular coupling element 36 may be integral; but it will be understood that the details of construction here referred to may be of less practical importance than such a proportioning of the mentioned parts, and such a positioning of the tachometer 23 relatively thereto, as to assure a light but reliable application of pressure (whether due to the action of gravity or resiliency of the tubing 38, or to both) tending normally to hold the interengaging non-circular coupling elements 34 and 36 in motion-transmitting contact,—notwithstanding any tilting and/or steering manipulation of the entire motor 10 by means of the arm 14 or its equivalent.

In use, it will be seen that the instrument 23 is positioned favorably to easy observation; that the flexible drive coupling may, however, be quickly disconnected at will (as, for the purpose of cranking the motor by the use of a knotted rope, not shown, in a known manner); and that, as a further precaution against damage to the instrument 23 during such cranking or during any desired inspection or repair, clamping bolts, or the nuts upon one or more of a plurality of bolts such as are shown at 42, 42′, and 43 may be so loosened as to permit a shifting of said instrument to an out-of-the-way position,—somewhat as suggested at 23′, 23″, and 23‴. The clamp 27 will be seen to be adjustable longitudinally and rotatively of that element of the frame 15 upon which it is secured: The arm 25 will be seen to be longitudinally and rotatively adjustable with reference to said clamp; and the clamp 28 will be seen to be adjustable both longitudinally and rotatively of the arm 26 of said bracket,—the result being that provision is made for positional adjustment in any or all of three planes, at right angles to one another, and for rotative adjustment to a preferred angle.

Although the foregoing description has included but one specific embodiment of this invention, it should be understood not only that various features thereof might be independently used, and that the organization referred to may advantageously be employed even upon outboard motors which are not adapted to be used in steering, but also that numerous modifications and adaptations to specific outboard motors might easily be devised,—all without involving the slightest departure from the spirit and scope of this invention, as the same is indicated above and in the following claims.

I claim:

1. An outboard motor organization comprising: a pivotally mounted motor including a non-rotary frame and a rotary shaft; a speed-responsive instrument; means for driving said instrument from said shaft; and shiftable means for supporting said instrument from said frame.

2. An outboard motor organization comprising: a movably mounted motor including a non-rotary frame and a rotary shaft; a speed-responsive instrument; means for driving said instrument from said shaft; and shiftable means for supporting said instrument from said frame,—said shiftable means comprising a bracket member provided with a clamp member engaging said frame.

3. An outboard motor organization comprising: a movably mounted motor including a non-rotary frame and a rotary shaft; a speed-responsive instrument; means for driving said instrument from said shaft; and shiftable means for supporting said instrument from said frame,—said driving means comprising a coupling which includes interengaging parts, and means tending yieldably to maintain said parts in engagement.

4. An outboard motor organization comprising: a movably mounted motor including a frame and a rotary shaft; a speed-responsive instrument; means for driving said instrument from said shaft; and shiftable means for supporting said instrument from

said frame,—said driving means comprising a flexible connection and a coupling; and said supporting means being so proportioned in relation thereto as normally to maintain parts of said coupling in contact.

5. An outboard motor organization comprising: a movably mounted motor including a non-rotary frame and a rotary shaft; a speed-responsive instrument; means for driving said instrument from said shaft; and shiftable means for supporting said instrument from said frame,—said supporting means comprising a bracket having a substantially vertical arm and a substantially horizontal arm, and means for clamping said substantially vertical arm to said frame.

6. An outboard motor organization comprising: a movably mounted motor including a non-rotary frame and a rotary shaft; a speed-responsive instrument; means for driving said instrument from said shaft; and shiftable means for supporting said instrument from said frame,—said driving means comprising a flexible element terminating in a non-circular part, and said shaft being provided with a nut having a corresponding non-circular part.

7. An outboard motor organization comprising: a movably mounted motor including a non-rotary frame and a rotary shaft; a speed-responsive instrument; means for driving said instrument from said shaft; and shiftable means for supporting said instrument from said frame,—said frame being provided with a steering handle, said supporting means being adjustably but rigidly connected for movement therewith.

8. An outboard motor organization comprising: a movably mounted motor including a non-rotary frame and a rotary shaft; a speed-responsive instrument; means for driving said instrument from said shaft; and shiftable means for supporting said instrument from said frame,—said supporting means comprising means for adjustment of parts thereof in three planes.

9. In combination: an outboard motor including both non-rotary parts, which are manipulable by a steering handle, and rotary parts; a tachometer; means, comprising a separable connection, for transmitting motion to said tachometer from one of said rotating parts; and shiftable means for normally supporting said tachometer from one of said non-rotary parts.

10. In combination: an outboard motor including both non-rotary parts, which are manipulable by a steering handle, and rotary parts; a tachometer; means, comprising a separable connection, for transmitting motion to said tachometer from one of said rotating parts; and shiftable means for normally so supporting said tachometer from one of said non-rotary parts as to maintain said separable connection.

11. In combination: an outboard motor including both non-rotary parts, which are manipulable by a steering handle, and rotary parts; a tachometer; means, comprising a separable connection, for transmitting motion to said tachometer from one of said rotating parts; and shiftable means for normally so supporting said tachometer from one of said non-rotary parts as to maintain said separable connection,—said last-mentioned part being comprised in a steering frame, and said shiftable means comprising a bracket which is provided with a clamp member engaging said frame.

In testimony whereof I affix my signature.

GORDON W. HARRY.