Jan. 31, 1933. E. A. WITKE 1,895,696

OUTBOARD MOTOR MOUNTING

Filed Jan. 27, 1932

Fig. 1.

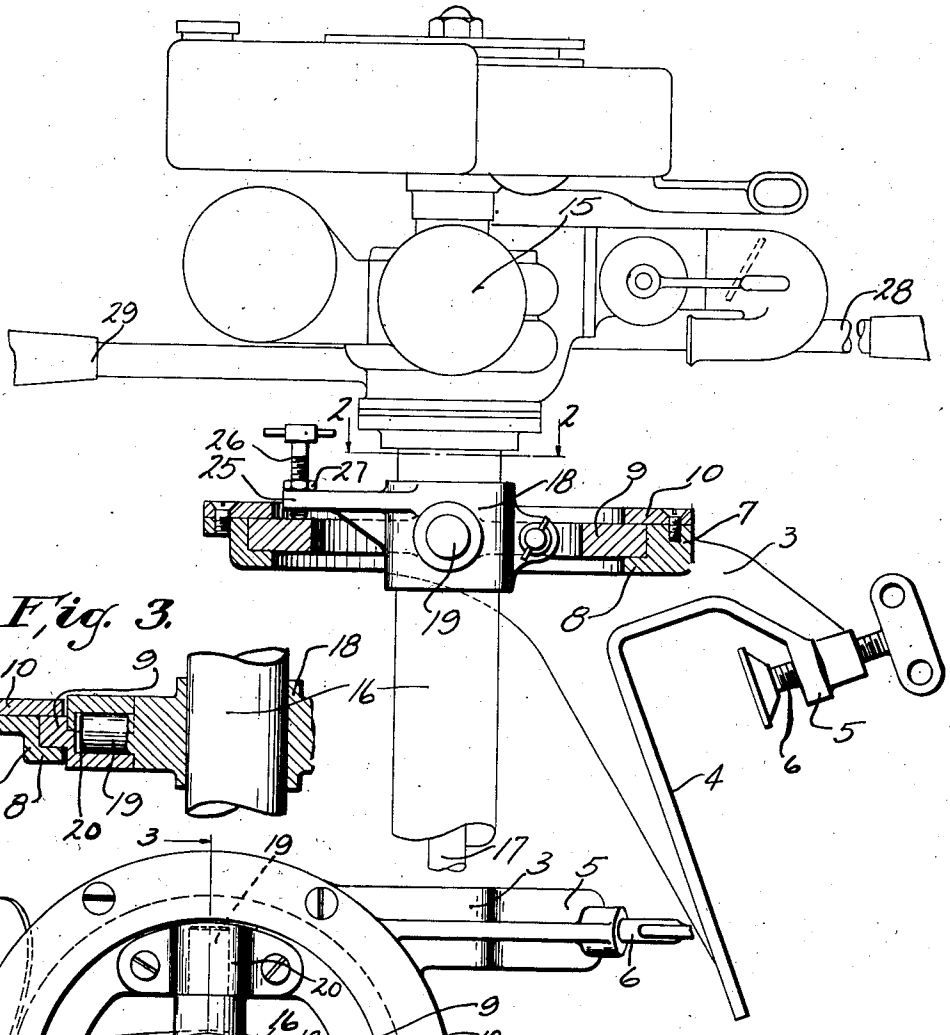


Fig. 3.

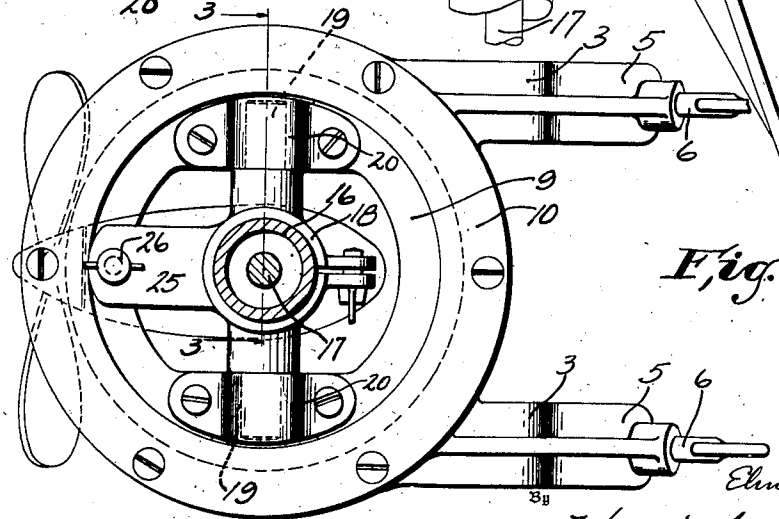


Fig. 2.

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OUTBOARD MOTOR MOUNTING

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This invention relates to improvements in outboard motor mounting, and has reference particularly to that class of outboard motor which reverses by a bodily turning movement and is tiltable upon encountering a submerged obstacle.

In the past it has been necessary to provide tiltable outboard motors with some sort of a lock effective upon the reversal of said motors to prevent them from tilting. It is the primary object of this invention to provide an outboard motor mounting in which the tilting status of the motor will be preserved at all times, the direction of thrust through parts relatively movable in the course of tilting being constant irrespective of the direction of propulsion, whereby there is no tendency for the motor to tilt when reversed, and accordingly no anti-tilting lock of any kind is required.

Tiltable dirigible outboard motors previously devised have in every instance been so designed that the collar in which the motor turns for steering or for reversal has partaken of the tilting movement. It is this fact which has made the use of anti-tilting locks necessary. It is my purpose in the present device to provide a motor wherein the collar or bearing in which the motor is dirigible for steering and reversal, does not partake of the tilting movement, the motor being tiltable with respect to this collar and hence capable of exerting its thrust constantly in a predetermined direction respecting said collar whether the motor is propelling a boat forward or astern.

More specifically stated, I propose to provide for a motor which is bodily reversible for steering and mounting which includes a fixed bearing, and a complementary bearing member dirigible with the motor for steering and reversing and with respect to which the motor is pivotally engaged and secured by an adjustable stop. It is my object to make the aforesaid mounting of such a character that it may comprise a separate object of manufacture and be applied either to existing motors or to motors specially designed in accordance with this invention.

It is a further important object of the invention to provide a motor which will be freely tiltable at all times and in all positions of dirigible adjustment, whether or not arranged forwardly or in reversal.

In the drawing:

Figure 1 is a view in vertical longitudinal section through a motor mounting embodying this invention and applied to an outboard motor of generally conventional design which is illustrated in side elevation.

Figure 2 is a plan view of the mounting taken in the plane indicated at 2—2 in Figure 1.

Figure 3 is a fragmentary detail in section taken in the plane indicated at 3—3 in Figure 2.

Like parts are identified by the same reference characters throughout the several views.

The mounting includes a pair of bracket arms 3 each of which comprises a portion 4 for engaging the rear of a boat transom, and a relatively shorter portion 5 carrying the usual set screw 6 adapted to be tightened against the front of the boat transom engaged by bracket arm portion 4.

Connecting the bracket arms 3 is an annular bearing ring 7 flanged at 8 to support a bearing member 9 which is freely rotatable within the ring and is retained therein by the annular closure 10.

An outboard motor including a power head 15 and a drive shaft housing 16 through which the drive shaft 17 leads to a conventional lower unit in the usual way, is mounted in a clamp ring 18. It is not necessary in the present application to illustrate in detail the lower unit nor the propeller carried thereby which appears conventionally in Fig. 2 and, as will be understood by all those familiar with this art, will, in its forward propelling position, exert its thrust to the right as the parts appear in Figs. 1 and 2.

The clamp 18 is provided with trunnions 19 which are engaged in sockets 20 formed in the sides of the bearing member 9, whereby the clamp and the outboard motor associated therewith are freely tiltable in a direction transverse to the thrust of the aforesaid propeller except as hereinafter noted.

It is necessary to provide means for accommodating the outboard motor to various boat transoms and to prevent the outboard motor from tilting forwardly in the direction of thrust of its propeller. The clamp member 18 is provided, therefore, with an arm at 25 which extends above a portion of the bearing member 9 and is adjustably limited in its movement toward said bearing member by means of a set screw 26, preferably provided with a lock nut at 27. With the bracket portion of the mounting secured to any given boat transom, the set screw is adjusted through arm 25 to fix the shaft housing 16 in the substantially vertical position in which it is designed to operate.

The adjustment of the motor to a vertical position can also be accomplished by attaching the bearing ring 7 to the bracket arms 3 by means of trunnions that could be locked in the desired position. This has the advantage that the steering axis will always be vertical.

It will be obvious that the thrust exerted on the lower portion of the shaft housing by the propeller in a direction toward the right in Fig. 1, cannot oscillate the supporting clamp 18 about trunnions 19 because of arm 25 and the engagement of set screw 26 with the rotatable bearing member 9. If, however, the lower unit strikes a submerged obstacle tending to swing shaft housing 16 about trunnions 19 to the left as viewed in Fig. 1, the entire motor will be free to tilt as a unit about said trunnions.

The outboard motor is provided at 28 with a tiller and at 29 with an auxiliary tiller normally projecting rearwardly, but available for use when the boat is being propelled rearwardly by the bodily reversed motor. When either tiller is in use the motor may be turned freely by the rotation of bearing member 9 in the fixed bearing annulus 10, and reversal is accomplished by simply turning the entire assembly around within said annulus.

It is particularly to be noted that regardless of the extent to which the motor is dirigibly manipulated within the fixed bearing annulus 7, the direction of thrust of arm 25 with respect to bearing member 9 and annulus 7 will remain constant, being invariably downwardly in the particular construction herein disclosed.

Because of this arrangement, it also follows that in any position of dirigible adjustment of the parts the entire motor is always free to tilt upon striking a submerged obstacle. The parts are not locked against tilting under any circumstances. This feature is a great advantage in maneuvering in shallow or obstructed waterways, in that it gives to the motor the same protection at all times which has heretofore been available only when the motor was in use for forward propulsion.

It will be observed that the clamp 18 is applicable to the shaft housing of any motor of suitable size, and said motor will be adjustable in the clamp to any desired height without affecting in any particular the tilting or other adjustments of the mounting.

I claim:

1. The combination with bracket means providing a bearing, of a bearing member dirigible with respect thereto, and an outboard motor tiltable with respect to said bearing member and extending through the bearing therefor.

2. The combination with bracket means, of a bearing member dirigible with respect thereto, an outboard motor tiltable with respect to said bearing member and having a propeller drive shaft casing and a propeller rotatable at an angle to said casing whereby to transmit thrust in a motor tilting direction, and means engageable between said motor and bearing member for limiting the tilting movement of said motor to a position in which the thrust of said propeller is approximately horizontal, said motor in all dirigible adjustments being freely tiltable from said position in opposition to said thrust.

3. An outboard motor mounting comprising bracket means providing, a bearing member dirigibly adjustable respecting said bracket means, and an outboard motor support pivotally tiltable upon said bearing member and extending through said bearing and provided with means limiting its tilting movement in one direction while permitting it freedom of tilting movement in an opposite direction from a predetermined position.

4. An outboard motor mounting comprising the combination with a bearing annulus, of an apertured bearing member rotatable with respect to said annulus, an outboard motor support registering with the aperture of said bearing member and pivotally tiltable about an axis transverse with respect thereto, and means for limiting the tilting movement of said support in one direction from a predetermined position.

5. A support for a tiltable motor comprising the combination with bracket means and a bearing member connected therewith and having an opening of sufficient size to receive and permit the movement of the shaft housing portion of the tiltable motor of a complementary bearing dirigibly adjustable respecting said member, an outboard motor support pivotally mounted for tilting movement upon a transverse axis within said bearing, and means for limiting the tilting movement of said support.

6. The combination with bracket means, of a non-tiltable bearing annulus carried thereby, an apertured bearing member rotatable respecting said annulus, an outboard motor support pivotally mounted for tilting upon said member, an arm tiltable with said motor

support and engageable in one direction of the tilting of said motor support with a non-tiltable part, and means adjustable for varying the point of engagement between said arm and part whereby to define a normal position of said support from which said support is freely tiltable in a direction to move said arm away from said part.

7. An outboard motor mounting comprising the combination with a bearing annulus, of a centrally apertured bearing member rotatable with respect to said annulus, of an outboard motor support registering with the aperture of said bearing member and pivotally movable about an axis transverse with respect thereto, and means for limiting the tilting movement of said support in one direction from a predetermined position, said means comprising an arm projecting across said member from said support.

8. An outboard motor mounting comprising the combination with a bearing ring and means supporting said ring for dirigible movement, of an outboard motor support tiltably adjustable upon an axis extending transversely of said ring and connected with said ring to partake of the dirigible movement thereof, and means adjustably engageable between said support and ring for determining a predetermined position of said support from which said support is tiltable in one direction only.

9. An outboard motor construction comprising a motor, a propeller, a driving shaft, a housing for said shaft, and a bracket carrying said housing, the mounting of said housing on said bracket comprising a part on said housing journaled on said bracket to permit rotation of said housing and said propeller to change the direction of thrust of said propeller for steering and for reversing a boat, said part on said housing also being journaled to permit tilting of said housing in a vertical plane coinciding with the line of thrust of said propeller in each steering and reversing position to which it may be rotated, and abutment means positioned between said housing and said bracket to prevent tilting of said housing in the direction of thrust of the said propeller, said abutment means permitting tilting of said housing in an opposite direction.

10. An outboard motor construction comprising a motor, a propeller, a driving shaft for said propeller, a substantially vertically disposed housing for said shaft, and a bracket carrying said housing, said housing being mounted in said bracket for rotation on a substantially vertical axis to change the direction of thrust of said propeller for steering and for reversing a boat, and being tiltable on a horizontal axis for oscillating movement in a plane coinciding with the line of thrust of said propeller in all positions to which said housing may be rotated, and abutment means positioned between said housing and said bracket and disposed to prevent tilting of said housing in the direction of thrust of said propeller, said abutment means permitting tilting thereof in an opposite direction.

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