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K. LENCK

STEERING ARRANGEMENT FOR MOTOR DRIVEN BOATS

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Fig. 1.

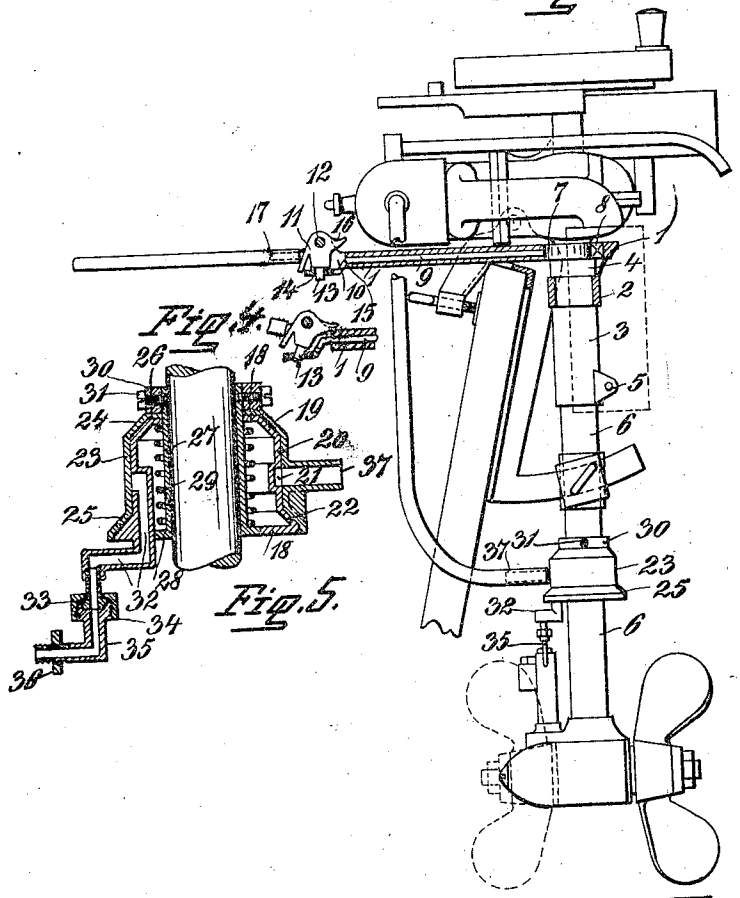


Fig. 4.

Fig. 5.

Fig. 3.

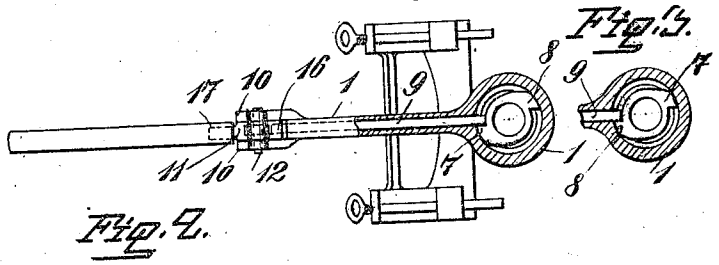


Fig. 2.

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UNITED STATES PATENT OFFICE.

KARL LENCK, OF BERLIN, GERMANY.

STEERING ARRANGEMENT FOR MOTOR-DRIVEN BOATS.

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To all whom it may concern:

Be it known that I, KARL LENCK, civil engineer, a subject of the German Emperor, and resident of 192–193 Friedrichstrasse, Berlin, W. 8, Germany, have invented certain new and useful Improvements in Steering Arrangements for Motor-Driven Boats, of which the following is a specification.

The present invention relates to a steering arrangement for motor-driven boats, in which, as shown, for example, by the German specification 155,847, the propeller casing is revolubly fitted on a vertical shaft in known manner. By swinging the propeller casing on this shaft the propeller may be set either straight, obliquely or reversely to the direction the boats is travelling, so that the boat may be steered straight ahead, to one side or may be reversed. The propeller casing may also be continuously revolved, so that the boat is practically driven both forward and astern at the same time, and thus will remain stationary, although motor and propeller continue to run.

It is known that by the torque which is imparted to the propeller in the water the propeller casing will revolve by itself in the same sense in which the propeller is driven. Therefore, for effecting the setting of the propeller casing in the desired oblique, astern or ahead position it is only necessary to stop the propeller casing in known manner in its rotation at such moment when it is in just the desired position. As during such continuous rotation of the propeller casing the flexible tube which connects the pump, fitted to the propeller casing, thus revolving therewith, with the motor cylinder which does not participate in the rotation, will wind around the propeller tube and, eventually prevent a further rotation, it has been tried to turn the propeller casing for steering aside, ahead or astern by positively gearing it by means of bevel gears and the like and a hand-wheel, whereby the propeller casing is turned through an angle of 360 degrees to the right and back again to the left.

The steering arrangements hitherto known have all the disadvantage, that they call for a special construction of the whole motor. The bearings containing the reversing levers and gears are partly cast in one piece with the motor cylinder, partly they require separate casings and the like, which again affect the construction of the motor. Above all the efficiency of such complicated steering arrangements is very unreliable because the bearings and casings are easily displaced or turned by the sudden blow-like vibrations caused in steering, and consequently cause the moving parts to hitch.

According to the present invention these disadvantages are avoided in a strikingly simple manner by the known clamping sleeve carrying the propeller tube not being rigidly but rotatably attached to the tiller. At the same time the tiller contains itself the various levers, slides, gears and the like required for moving or retaining the propeller casing, so that the hereinbefore mentioned hitching of the moving parts can no more occur, as the tiller itself takes up the blow produced in reversing. The new steering arrangement affords the further advantage that it may be instantly fitted to any known outboard motor which has no reversing gear, by simply removing the existing tiller, rigidly connected to the clamping sleeve and substituting in its place the new tiller, containing the revoluble clamping sleeve besides the operating and locking devices. The present invention also avoids the pump tube winding itself around the propeller tube by fitting a water-distributor to the pump, the inner part of which participates in the rotation of the pump, while the outer part is rotatably fitted on the inner part and may remain stationary together with the flexible tube attached to it.

In the accompanying drawing the present invention is exemplified in several embodiments.

Fig. 1 is an outboard motor with a reversing tiller utilizing the torque of the propeller casing and a water-distributor, in side elevation and partly in section.

Fig. 2 is a top view of the tiller set for driving ahead;

Fig. 3 is a top view of a part of the tiller set for driving astern;

Fig. 4 is a top view of the tiller set for stopping the boat while the motor continues to run;

Fig. 5 is a longitudinal section through a water distributor with conical jointing surfaces.

The tiller 1 carries at its ring-shaped rear

end the journal 2, in which the propeller tube sleeve 3 revolves. The latter bears with its collar 4 on the bearing. The propeller tube 6 is clamped in the usual manner in the sleeve 3, and the latter has at its upper end two clutch teeth 7 and 8, in front of which a slide or bolt 9 engages, which is slidably fitted in the tiller 1. The tiller is, at its front end, made in the shape of a fork 10, in which a latch 11 rocks on pin 12. This latch engages with its projection 13 in the slot 14 of the bolt 9 and thereby moves the latter forward or backward when the latch is rocked up and down after the tiller handle has been fitted on pin 17. The rocking of the latch 11 is limited by the set-off of the bolt and the nose 16 of the latch itself.

When the tiller handle is lowered into a horizontal position (Fig. 1) the bolt 9 enters the path of the teeth 7 or 8 so that the propeller casing must stop. When tooth 7 bears against bolt 9 (Fig. 2) the boat will travel ahead, when on the other hand tooth 8 bears against bolt 9 (Fig. 3) the boat will travel astern. When the tiller handle is permanently held upwards (Fig. 4) the teeth are clear and the boat will remain stationary, although the motor continues to run.

In order that the pump tube should not participate in the rotation of the propeller tube or the pump, respectively, and, in consequence thereof, wind around the propeller tube, the pump is provided with a water distributor. This distributor, Fig. 5, contains an inner body 18 with conical surfaces 19 and 22 and the cylindrical surface 20. In the middle of the latter is a passage 21, to which the water of the pump is supplied through pipe 32. On this inner body revolves an outer body, which has a cylindrical surface 23 and the conical surfaces 24 and 25 and, at the top, a bearing surface 26. In the latter revolves a tube 27 with a flange 28 on which rests a spring 29. This spring presses upwards against the inner body; the pressure of the spring against the flange is transmitted to the outer body by the tube 27 having at its upper end a collar 30 secured to it by means of set-screws 31; which collar revolubly rides on the bearing surface 26. The spring will, therefore, keep the conical surfaces pressed against each other and form a tight joint for the passage 21 towards outside. To the outer body a nipple 37 is fitted at the part over the passage 21 so that the water from the said passage may flow off therethrough when the pump operates. The tube 32 has a cone 33 on which revolves a cap nut 34. The latter is screwed over the threaded cone of an elbow tube 35, which, on its other leg carries a lock nut 36. For securing the water distributor on the propeller tube the elbow tube is unscrewed from the pump, to which tube the flexible tube had been attached. Then the cap nut 34 is unscrewed, turning it to the left, from the new distributor, so that the elbow 35 is detached. This elbow is now screwed into the pump in place of the one previously removed, but the lock nut is not yet tightened. Then the distributor is fitted on the propeller tube 6 and adjusted in such a manner, that the middle of the cone 34 is exactly over the middle of the cone provided on the upper end of the elbow 35. If the centers do not register exactly, the elbow 35 must be screwed farther into the pump or unscrewed so far until the centers register exactly. Then the cap nut 34 is screwed down tightly on the elbow 35 and now the lock nut 36 is tightened.

Instead of the sliding bolt, a shaft might be disposed in the tiller, terminating at the rear in a bevel gear, which meshes with another bevel gear fitted to the clamping sleeve instead of the clutch teeth. If this shaft has at its front end a small handwheel, it will be possible to reverse the motor by turning this handwheel, and to steer the boat by rocking it to and fro together with the tiller.

I claim:

1. Steering arrangement for motor-driven boats having a propeller casing revoluble around a vertical axis, said propeller casing supported by a tube secured in a clamping sleeve, said clamping sleeve revolubly fitted in a bearing of said tiller beneath the plane of the latter, the said clamping sleeve containing two clutch teeth, in said tiller a sliding bolt adapted to engage with said teeth or clear them respectively.

2. Steering arrangement for motor-driven boats having a propeller casing revoluble around a vertical axis, said propeller casing supported by a tube secured in a clamping sleeve, said clamping sleeve revolubly fitted in a bearing of said tiller beneath the plane of the latter, the said clamping sleeve containing two clutch teeth, in said tiller a sliding bolt adapted to engage with said teeth or clear them respectively, hinged to the front end of said sliding bolt a rocking latch, said latch having an extension adapted to receive a tiller handle, said latch adapted to reciprocate said sliding bolt.

3. Steering arrangement for motor-driven boats having a propeller casing revoluble around a vertical axis, said propeller casing supported by a tube secured in a clamping sleeve, said clamping sleeve revolubly fitted in a bearing of said tiller beneath the plane of the latter, the said clamping sleeve containing two clutch teeth, in said tiller a sliding bolt adapted to engage with said teeth or clear them respectively, hinged to the front end of said sliding bolt a rocking latch, said latch having an extension adapted to receive a tiller handle, said latch adapted to reciprocate said sliding bolt and provided with an

abutment cooperating with a set-off of the sliding bolt to limit the stroke of said sliding bolt.

4. Steering arrangement for motor-driven boats having a propeller casing revoluble around a vertical axis, said propeller casing supported by a tube secured in a clamping sleeve, said clamping sleeve revolubly fitted in the tiller, a pump pipe connected to one of two bodies forming a water distributor, in one of said bodies a passage communicating with said pump pipe, the second body of the distributor revolving over said first body and having a nipple to which the flexible pump tube is attached, said nipple communicating with said passage.

In testimony whereof I have hereunto signed my name this 16th day of November, 1914, in the presence of two subscribing witnesses.

KARL LENCK.

Witnesses:
HENRY HASPER,
WOLDEMAR HAUPT.