(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 109 370**
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **83850219.3**

(22) Date of filing: **19.08.83**

(51) Int. Cl.³: **B 63 H 21/22**, G 05 G 9/08

(30) Priority: **20.08.82 SE 8204782**

(43) Date of publication of application: **23.05.84**
Bulletin 84/21

(84) Designated Contracting States: **DE FR GB IT NL**

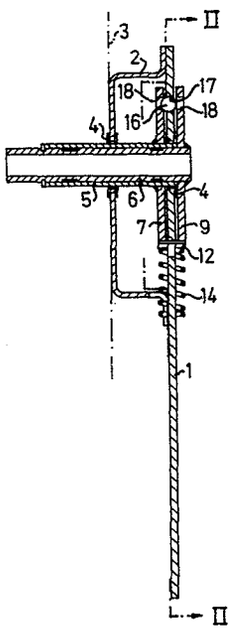
(71) Applicant: **Teknoflex Controls AB, Fröfästegatan 102, Västra Frölunda (SE)**

(72) Inventor: **Bagge, Nils Olof, Vadmansgatan 12, S-412 53 Göteborg (SE)**

(74) Representative: **Hellbom, Lars Olof et al, H. Albihns Patentbyra AB Box 7664, S-103 94 Stockholm (SE)**

(54) Two-lever control, especially for boat motors.

(57) The invention relates to a two-lever control for throttle and shift control in boat motors. The control has two concentrically mounted shafts (5, 6) designed to be joined to individual operating levers. On each shaft there is fixed a disc (7, 9) with an arm (8, 10) designed to be connected to a control cable. The discs are located on either side of a fixed plate (1) which has a bore (17) in the area between the discs. In the bore there is a ball (16) which can be alternatively displaced into the bores (18) in the discs in order to lock one disc against rotation when the other is rotated. The disc which controls shifting has a bore (18) for each shift position, while the disc controlling the throttle has a bore (18) in the idle position, which means that shifting can only be done when the throttle control is in the idle position.



0109370

Two-lever control, especially for boat motors

The present invention relates to a manual control with individually operated means for controlling two different functions, preferably for actuating the throttle and shift mechanism in boat motors, comprising two concentrically mounted shafts to be joined to individual operating levers and two control members, rigidly joined to individual shafts and designed to be connected to individual means for transmitting movement, preferably control cables.

Boat motor controls can be divided into two main types, namely so-called two-lever controls and one-lever controls, each of which has advantages and disadvantages. The two-lever control controls the throttle function and the shift function entirely independently of each other. The advantage of such a control is that the lever movements when shifting between full speed forward and full speed reverse can be kept within an angular sector of 90°; the disadvantage is that there is no locking means against shifting at high engine speed, and thus there is a risk of improper use and damage to the reversing gear engaging mechanism. A one-lever control eliminates the risk of incorrect operation, since the throttle is opened by moving the lever in either direction from an idling range within which shifting is effected, but on the other hand the construction of this control requires a lever movement of approximately 210° for moving from full speed forward to full speed reverse. This means that a one-lever control cannot be placed in a convenient position on a wheel pedestal because the lever would then stick in between the wheel spokes at least in one of its end positions.

The purpose of the present invention is to achieve a control of the type described by way of introduction, primarily intended for engines in wheel-steered sail boats,

which has small dimensions in order to be able to be placed in a wheel pedestal and the construction of which prevents improper operation.

This is achieved according to the invention by virtue of the fact that the control members are formed of a pair of discs both on opposite sides of a stationary member and having cavities facing the stationary member, the form and placement of said cavities being adapted to a locking body supported by the stationary member and movable in the direction of the shaft, that either disc can be rotated from a neutral position in which a cavity in each disc lies directly opposite the locking body, whereby rotation of one disc from the neutral position results in insertion of the locking body in the cavity of the second disc to lock it against rotation relative to the stationary member.

The control according to the invention combines the advantage of having a short lever movement in the two-lever control with the advantage of the one-lever control of preventing improper operation by only allowing the shift lever to move when the throttle lever is in the idling position.

The invention will be described in more detail with reference to the example shown in the accompanying drawing. Fig 1 shows a longitudinal section through a control according to the invention, Fig 2 shows a view along the line II-II in Fig 1, Fig 2a shows a perspective view of a part in Figs 1 and 2, and Figs 3 and 4 are plan views of additional parts in Figs 1 and 2.

The control shown comprises a rectangular plate 1, to which a sheet metal piece 2, bent to a U-shape, is screwed, which is in turn intended to be screwed fast to the inside of a panel or pedestal 3. The plate 1 and the

piece 2 are provided with circular openings with bearings 4, in which a hollow shaft 5 is rotatably mounted. A shaft 6 is rotatably mounted in the shaft 5. Both of the shafts project through the panel 3 and are designed to be joined to individual operating levers. A circular sheet metal disc 7 with an arm 8 is welded to the shaft 5, and a corresponding disc 9 with an arm 10 is welded to the shaft 6. The arms 8 and 10 are to be connected to individual control cables, as indicated with the dashed lines in Fig 2.

In the example shown, the arm 8 of the disc 7 is designed to control the shifting between forward and reverse. The disc has along its peripheral edge V-shaped notches 11 indicating the positions forward, neutral and reverse. A slotted sheet metal piece 12 (Fig 2a) bent in the middle to a V-shape, is placed in a U-shaped notch 13 in the plate 1 and is biased towards the edge of the discs by a spring 14, so that the ridge 15 is pressed into the cavities as the disc 7 turns to distinctly mark the shift lever positions. The arm 10 of the second disc 9 is intended to control the throttle and the disc has a corresponding notch 11 marking the idle position.

Between the discs 7,9 there is a locking body in the form of a ball 16, which is mounted in a bore 17 in the plate 1. The radius of the bore 17 is slightly larger than the radius of the ball 16, so that the ball can be easily displaced in the bore. Along a circular arc with a radius equal to the distance between the axis of rotation of the discs and the center of the ball, the disc 7 has three bores 18, the radii of which are less than the radius of the ball. The bores 18 are distributed along said arc in such a way that a bore 18 is always directly in front of the ball 16 when the ridge 15 of the piece 12 is pressed into one of the cavities 11, i.e. in each of the positions forward, neutral and reverse. The disc 9 has a similar

bore 18 which is placed in a corresponding manner so that it lies directly in front of the ball 16 in the idle position, but has no other bores within its control range.

The diameter of the ball 16 is greater than the distance between the discs and is adapted to the diameter of the bores 18 so that one disc moves completely free of the ball when the ball is in contact with the edge of a bore in the other disc. Figs 1 and 2 show the discs 7,9 in the neutral and idling positions. The ridge 15 projects into the middle cavity 11 of the disc 7 and into the only notch 11 in the disc 9. The middle bore 18 of the disc 7 and the single bore 18 of the disc 9 lie directly in front of the ball 16. Either disc can be rotated from this position and this will result in the ball being displaced into a bore 18 in the disc which is not rotated, thereby locking it. Thus it is not possible to turn the discs at the same time nor to turn one disc if the other disc has no bore directly in front of the ball. This means consequently that a gear lever joined to the shaft 5 will be locked in one of the positions reverse, neutral or forward at all speeds over idle, when the single bore 18 of the disc 9 is displaced from the ball. This also means that it is not possible to accelerate from idle before the shifting operation has been completed, i.e. before one of the three bores 18 of the disc 7 has been moved directly in front of the ball 16.

As can be seen in Figs 3 and 4, the discs with associated arms are symmetrical in relation to a line a through the arm, and the above-mentioned notches 11 and bores 18 are located on either side of this line. To make reverse mounting of the control possible, i.e. alternative port or starboard mounting, each disc is provided with an extra notch 11' and bores 18' which are placed on opposite sides of the line a so as to produce complete symmetry.

The simple construction of the control makes it possible to keep production tool costs low. It can be made largely by stamping and cutting sheet metal and tubing, preferably of stainless acid-proof steel, which can withstand a corrosive environment and will not affect an adjacent compass.

CLAIMS

1. Manual control with individually operated means for controlling two different functions, preferably for actuating the throttle and shift mechanism in boat motors, comprising two concentrically mounted shafts to be joined to individual operating levers and two control members, rigidly joined to individual shafts and designed to be connected to individual means for transmitting movement, preferably control cables, characterized in that said control members are formed of a pair of discs (7,9) disposed on opposite sides of a stationary member (1) and having cavities (18) facing the stationary member, the form and placement of said cavities being adapted to a locking body (16) supported by the stationary member and movable in the direction of the shaft, that either disc can be rotated from a neutral position, in which a cavity in each disc lies directly opposite the locking body, whereby rotation of one disc from the neutral position results in insertion of the locking body in the cavity of the second disc to lock it against rotation relative to the stationary member.

2. Control according to Claim 1, characterized in that one shaft (5) is intended to control the shifting function of a boat motor and has on its disc (7) three cavities (18) along a circular arc having its center at the rotational axis of the disc (7), the cavity in the middle defining the neutral position and the other cavities each shift position, while the second shaft (6) is designed to control the throttle and has on its disc (9) only one cavity (18) defining the neutral position within its effective control range to lock the first disc in all positions effecting a throttle opening above idle.

3. Control according to Claim 2, characterized in that the discs (7,9) are circular, that the cavities (18) are

formed of axial through bores spaced from the axis of rotation of the discs and that the locking body (16) is a ball of greater radius than the radius of the bore.

4. Control according to Claim 3, characterized in that each disc (7,9) is provided with additional cavities (11), in which on a spring-biased catch body (12) movably mounted the stationary member (1) is engaged in the neutral position of the discs and in the two shift positions of one disc.

5. Control according to Claim 4, characterized in that said additional cavities (11) are placed along the peripheral edge of each disc (7,9).

6. Control according to one of Claims 1-5, characterized in that the discs (7,9) and the stationary member (1) are made of sheet metal.

0109370

FIG. 3

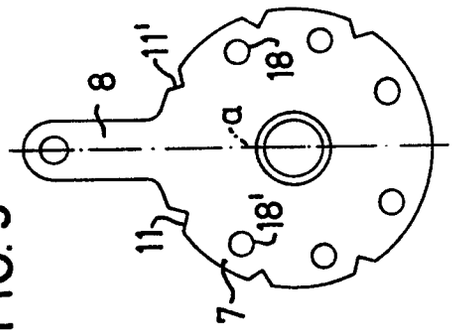


FIG. 4

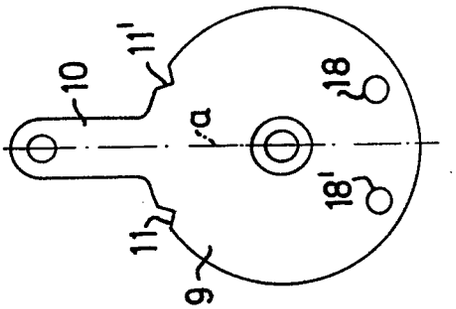


FIG. 2a

FIG. 2

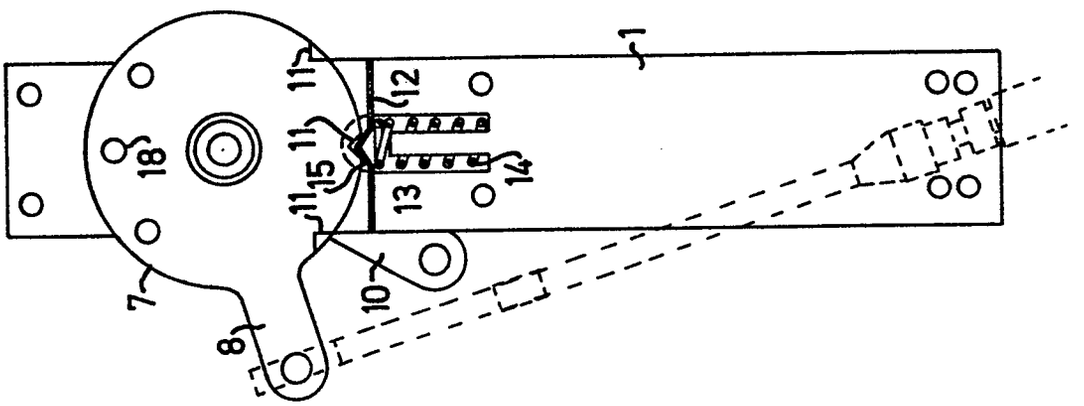


FIG. 1