

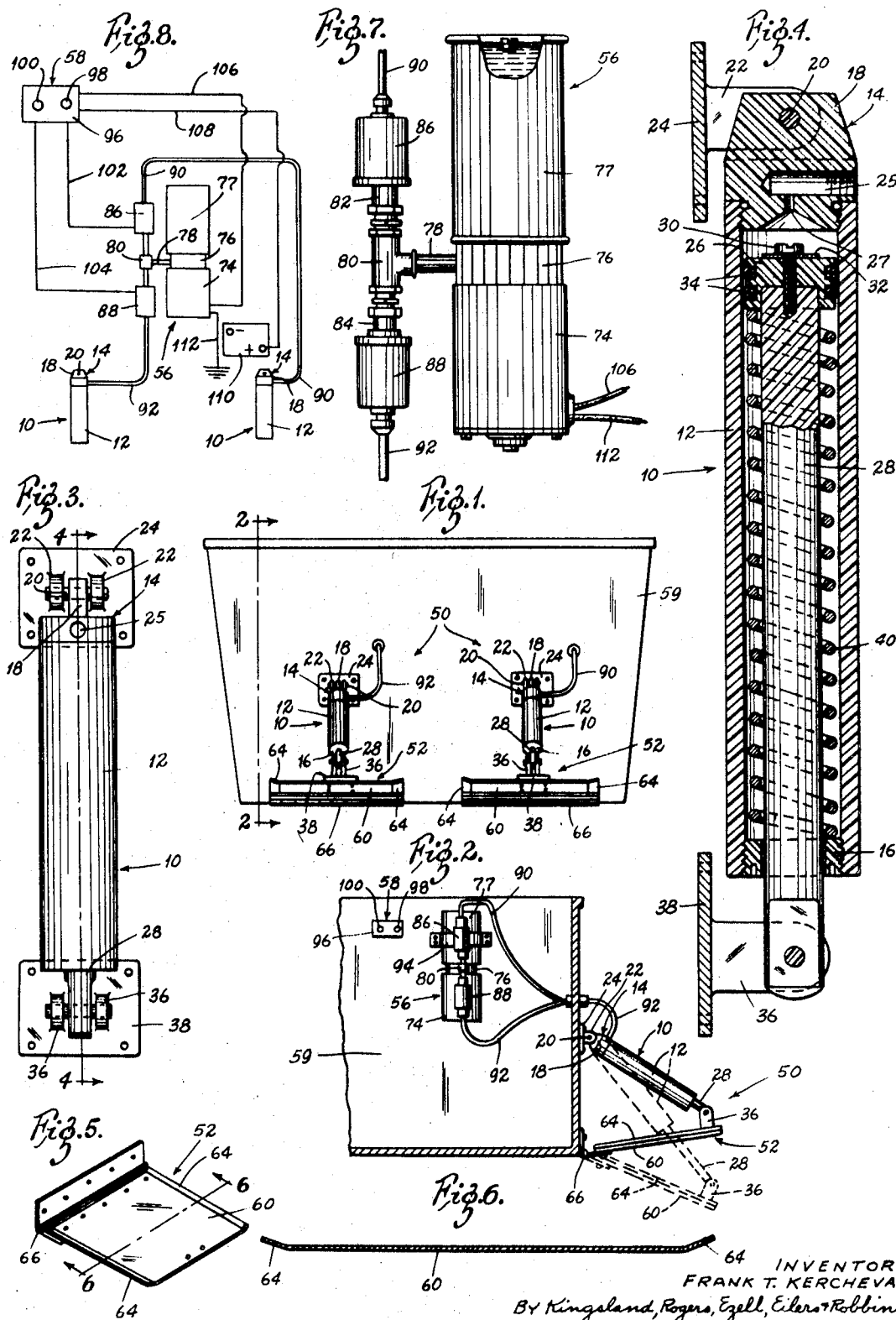
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BOAT LEVELER MECHANISM PISTON CONSTRUCTION

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BOAT LEVELER MECHANISM PISTON
CONSTRUCTION

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2 Claims

ABSTRACT OF THE DISCLOSURE

An improved piston construction for a boat leveler mechanism comprising a cylinder, a piston, and a piston rod of filled nylon material designated Nylatron GS, and the like, and a stainless steel return spring for moving the piston in one direction.

BACKGROUND OF THE INVENTION

Field of the invention

The present invention relates generally to the power boat art, and more particularly to boat leveler mechanisms for trimming boats laterally and longitudinally, specifically to an improved piston construction for a boat leveler mechanism through which a boat tab is raised and lowered, and in combination as part of said mechanism.

Description of the prior art

Boat leveling constructions have been made for many, many years, both manually and power operated. The major purposes of these constructions are to determine the position of the bow and to trim the boat in respect to disposition of the load laterally. A serious maintenance problem involved in mechanisms heretofore made is in the piston construction through which a tab is raised and lowered. Electrolysis and rust have quickly destroyed the casing and other parts of the piston construction, requiring frequent replacement. There has long existed the need for an improved piston construction having long life and requiring little or no maintenance, and for a boat leveler mechanism incorporating the same.

SUMMARY OF THE INVENTION

The present invention comprises an improved piston construction for a boat leveler mechanism comprising a cylinder, a piston, and a piston rod which are of a material eliminating electrolysis and rust. Specifically, these parts of the present novel piston construction are of Nylatron GS, defined infra, and the like. A stainless steel return spring is disposed within the cylinder and functions to return a tab to raised inoperative position. The invention encompasses the improved piston construction and in combination as an integral part of the disclosed boat leveler mechanism.

Hence, objects of the present invention are to provide a piston construction which fulfills the long need existing in the art, which eliminates electrolysis and rust, thereby insuring long life with substantially no maintenance, which provides a sturdy, strong piston unit for effectively lowering and returning a boat tab to inoperative position, and which otherwise fulfills the objects and advantages sought therefor.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a view of the rear end or stern of a boat with a power actuated boat leveler mechanism mounted thereon including two tabs each having an improved piston construction of the present invention associated therewith;

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FIGURE 2 is a vertical longitudinal section taken on substantially the line 2—2 of FIGURE 1, other working parts of the boat tab construction being shown interiorly and an operative position of the tabs being shown in broken lines;

FIGURE 3 is a view of the present improved piston construction with a mounting bracket at each end;

FIGURE 4 is an enlarged longitudinal cross-sectional view taken on substantially the line 4—4 of FIGURE 3;

FIGURE 5 is an isometric view of a boat tab;

FIGURE 6 is an enlarged transverse cross-sectional view taken on substantially the line 6—6 of FIGURE 5;

FIGURE 7 is an enlarged view and at ninety degrees of the assembly shown mounted on the interior of the boat in FIGURE 2; and

FIGURE 8 is a wiring and hydraulic diagram of the instant boat leveler mechanism.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing more particularly by reference numerals, 10 indicates generally an improved piston construction forming part of a boat leveler mechanism, as illustrated in the drawing, which includes a cylinder 12 threadedly receiving at its upper end a plug 14 and threadedly receiving at its lower end a ring 16 (FIGS. 1-4). The cylinder 12, the plug 14, and the ring 16 are of filled nylon sold under the trademark Nylatron GS by The Polymer Corporation, Polypenco Division. This material is structurally strong, electrolysis free, and, hence, there is no deterioration of the parts and no malfunctioning of the unit. The plug 14 has an attachment flange 18 which is connected by a suitable pin 20 between ears 22 of a bracket 24. The plug 14 has a threaded radial well 25 therein communicating with an axial passage 27 leading into the cylinder 12. Within the cylinder 12 is a piston 26 mounted on the end of a piston rod 28 by means of a screw 30 and washer 32, the piston 26 and piston rod 28 being of Nylatron GS. Neoprene O-rings 34 are provided as a seal to prevent the leakage of oil, and the like, from the hydraulic system referred to below. The lower end of the piston rod 28 is pivotally connected between ears 36 of a bracket 38. The piston rod 28 extends through the ring 16, there being sufficient clearance to permit free movement. A strong steel spring 40 surrounds the piston rod 28, engaging the ring 16 at the lower end and the piston 26 at the upper end, thereby tending at all times to move the piston 26 upwardly and with it a tab to which the piston construction 10 is attached.

The present novel piston construction 10 is a key part of a boat leveler construction 50, which also includes tabs or stabilizers 52, a power unit 56, a double electric switch 58, and connecting fluid lines and electrical leads. The relationship of the piston construction 10 to the tabs 52 and to a boat 59 is illustrated in FIGURES 1 and 2.

Each tab or stabilizer 52 comprises a plate 60 having flanges 64 along the ends which may be at an angle of fifteen degrees and which contribute to greater stability. The plate 60 is secured to one part of a hinged mounting bracket 66. It is clear from FIGURES 1 and 2 that one portion of the mounting bracket 66 is adapted to be secured to the back of the boat 59 by suitable screws, or the like, along the bottom edge, as shown.

The power unit 56 comprises a 12-volt high speed enclosed motor 74, a high speed gear rotor driven pump 76 operatively connected to the motor 74, producing five hundred pound pressure, or whatever is required to actuate the tabs 52. Leading from the pump 76 is a brass tube fitting or pipe segment 78 which connects with a T-fitting 80 which is connected by fittings 82 and 84 with electric solenoid check valves 86 and 88, respectively. The

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check valve 86 is connected by a fluid line 90 to one piston construction 10 and the check valve 88 is connected by a fluid tube 92 to the other piston construction 10. Normally, the power unit 56 is mounted on a board for convenience, since it is a simple matter to attach such a board to any suitable part of the boat 59 out of the way of personnel. In FIGURE 2, the power unit 56 is illustrated as mounted on the side of the boat 59 by a strap bracket 94 which is adequate for this purpose.

The switch unit 58 includes a panel 96 and two switches 98 and 100 of the momentary on-off type, each switch 98 and 100 being biased to a central neutral position when not held in on or off positions. A lead 102 connects the switch 98 with the solenoid 86, and a lead 104 connects the switch 100 with the solenoid 88, as is clear from FIGURE 8. A lead 106 connects the switch 100 with the motor 74 and a lead 108 connects the switches 98 and 100 and the circuit into the positive terminal of the battery 110 of the boat 59. A lead 112 connects the motor to ground.

In operation of the boat leveler mechanism 50, it is readily appreciated from the foregoing that the tabs 52 are electrohydraulically actuated into selected operative positions, independently or separately, by the switch unit 58. Once positioned, the tabs 52 are maintained in selected positions by the electric solenoid check valves 86 and 88 which retain the fluid in the lines 90 and 92, and in the top of the cylinders 12 above the neoprene O-rings 34. Should it be desired to return the tabs 52 to inoperative positions, the switches 98 and 100 are moved to the upper positions, whereupon the solenoids 86 and 88 are deenergized and the heavy compression springs 40 move the piston rods 28 into substantially the position of FIGURE 4, thereby raising the tabs 52 to the full line positions of FIGURE 2 and returning the fluid in the upper end of the piston construction 10 in major part back to the oil reservoir 77.

It is manifest that there have been provided a novel improved boat leveler mechanism piston construction and a boat leveler mechanism of which said piston mechanism is an essential part, which fulfill the objects and advantages sought therefor.

It is to be understood that the foregoing description and the accompanying drawings have been given by way of illustration and example. It is also to be understood

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that changes in form of the elements, rearrangement of parts, and substitution of equivalent elements, which will be obvious to those skilled in the art, are contemplated as within the scope of the present invention which is limited only by the claims which follow.

What is claimed is:

1. An improved piston construction for an electrohydraulic power actuated boat tab construction comprising a cylinder, said cylinder being of a material designated Nylatron GS, and the like, a piston in said cylinder, a piston rod movable into and out of said cylinder, said piston and piston rod being of a material designated Nylatron GS, and the like, and a compression spring in said cylinder biasing said piston towards one end to move the piston rod inwardly.

2. In an electrohydraulic boat leveling construction, in combination with movable leveling tabs including means for mounting on the rear of a boat, a compact integrated electrohydraulic power unit for moving said tabs against water action and maintaining them in desired positions installable inside a boat including a pump, an electric motor for driving said pump, an oil reservoir, hydraulic lines, and solenoid valves for control of oil in the hydraulic lines, and switch means for actuating said unit, of an improved piston construction comprising a cylinder, said cylinder being of a material designated Nylatron GS, and the like, a piston in said cylinder, a piston rod movable into and out of said cylinder, said piston and piston rod being of Nylatron GS, and the like, and a compression spring in said cylinder biasing said piston towards one end to move the piston rod inwardly.

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