June 5, 1956 L. GUAY 2,748,613

LEVER AND SLIDE MOTION CONVERTING MEANS WITH SLIDABLE CONNECTION

Filed Nov. 8, 1951

Fig. 1

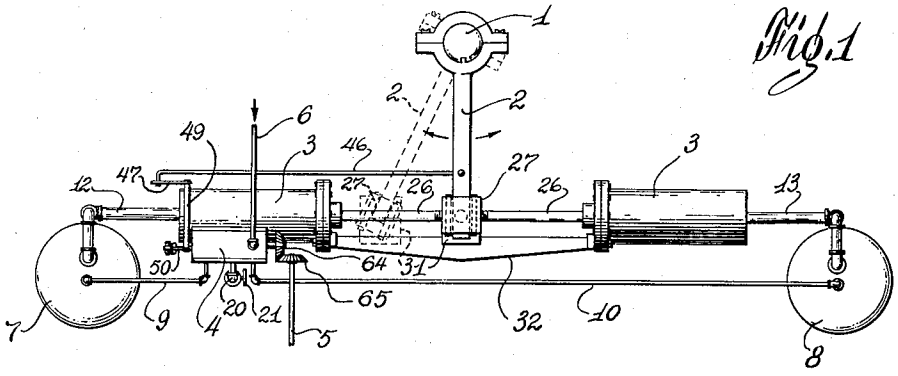
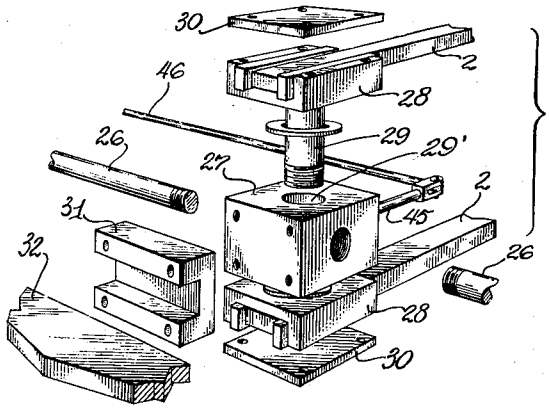


Fig. 2



Inventor

Lucien Guay

Robic & Bustier

Attorneys

United States Patent Office

2,748,613

Patented June 5, 1956

2,748,613

LEVER AND SLIDE MOTION CONVERTING MEANS WITH SLIDABLE CONNECTION

Lucien Guay, Lauzon, Levis, Quebec, Canada

Application November 8, 1951, Serial No. 255,396

1 Claim. (Cl. 74—104)

The present invention relates to a lever and slide motion converting means with slidable connection more particularly adapted to be used in conjunction with a pressure fluid operated steering mechanism for marine vessels and the like.

The general object of the present invention is the provision of a device of the character described which is of rugged construction and yet may be easily and quickly dismantled for repairs or part replacement.

Another important object of the present invention is the provision of an arrangement of the character described in which a block is secured to the piston rods of a pair of pressure liquid actuated double-acting power motors disposed in alignment, said block having a slidable connection with a lever secured to the member to be oscillated by the power motors and so arranged that said block is positively guided in its reciprocating movement so that there will be no deformation of the piston rods under stress and strain.

Still another important object of the present invention is the provision of an apparatus of the character described in which the lever means which are slidably connected to the block, consist of two vertically superposed levers one disposed above and one underneath said block whereby the stresses exerted by the member to be oscillated are equally balanced and do not effect any overturning force on the block whereby there are no bending stresses imparted to said block or to the piston rods connected to said block.

Yet another important object of the present invention is the provision of an arrangement of the character described in which the pair of levers may be quickly removed from the block without having to dismantle said block from the piston rods secured thereto.

Still another important object of the present invention is the provision of a mechanism of the character described which is more particularly adapted for use in conjunction with the steering gear of a ship and which is strong enough to resist all stresses normally encountered by such a steering gear.

The foregoing and other important objects of the present invention will become more apparent during the following disclosure and by referring to the drawings in which:

Figure 1 is a plan view of a steering system; and

Figure 2 is a perspective exploded view of the connections between the rudder post and the piston rods of the power motors.

Referring now more particularly to the drawings in which like reference characters indicate like elements throughout, the pivotally mounted member to be oscillated, which may be a rudder post, is indicated by the numeral **1** and on it are rigidly secured two vertically superposed horizontally extending arms **2** for actuation by power motors **3**, the operation of which is controlled through the valve box **4** by a control shaft **5** and bevelled gears **64** and **65**. The valve box **4** is connected to a source of gas under pressure by means of a pipe **6** and distributes said pressure gas to a pair of gas-liquid tanks **7** and **8** through the gas conduits **9** and **10** respectively.

The tanks **7** and **8** are partly filled with a liquid and this liquid is fed to the power motors **3** by the liquid conduits **12** and **13**, respectively, connecting said tanks with the left and right end of said power motors.

The valve box **4** is provided with an exhaust port

connected to the exhaust pipe **20** provided at its discharge end with a throttle valve **21** for adjusting the counter pressure in the exhaust port and pipe **20**.

Each power motor **3** is a pressure liquid double actuating cylinder and piston unit, the piston rod **26** of which is coaxial with the piston rod of the other power motor, said two piston rods being threadedly connected at their free ends to a common block **27**, shown in more detail in Figure 2. Two guiding elements **28** are pivotally mounted on the block **27** at the top and bottom faces thereof by being secured to a bolt **29** which is rotatably mounted in a bore **29'** made in said block **27**. The ends of the bolt **29** project from the block **27** to threadedly engage the guiding elements **28**. Said guiding elements **28** have a U-shaped cross-section and slidably receive the free end of the arms **2**; retaining plates **30** are bolted to the guiding elements **28** to prevent disengagement of the arms **2**. A channel **31** is secured to the side face of the block **27** opposite the member **1** and slidably engages a guide member **32** which extends parallel with the piston rods **26** and is secured at both ends to the cylinders of the power motors **3**, as shown in Figure 1.

The valve box **4** is provided with a shuttle valve (not shown) which controls fluid admission to the power motors **3** in such a way as to lock the arms **2** in the angular position corresponding to the control position of the shaft **5**. Said shuttle valve is mechanically linked to the block **27** by rod **45**, link **46**, lever **47**, shaft **49** and lever **50**.

While a preferred embodiment according to the present invention has been illustrated and described it is understood that various modifications may be resorted to without departing from the spirit and scope of the appended claim.

I claim:

In a device of the character described, a pair of pressure liquid actuated double acting power motors disposed in spaced alignment, two axially aligned piston rods projecting from said motors towards each other, said piston rods being threaded at their outer adjacent ends, a common block of rectangular shape threadedly connected to the outer end of said piston rods, said block having a bore, a bolt rotatable within said bore and projecting therefrom at both ends, two guiding elements in the form of channel members threadedly connected to the projecting ends of said bolt, a pivotally mounted member to be oscillated, two vertically superposed arms secured to said last named member and slidably inserted in said guiding elements for actuation thereby, a channel bolted to said common block, a stationary guide member secured to said power motors and extending parallel to said piston rods, said channel slidably engaging said guide member, and retaining plates bolted to said guiding elements over said arms to prevent disengagement of said arms from said guiding elements.

References Cited in the file of this patent

UNITED STATES PATENTS

486,095	Elmes	Nov. 15, 1892
526,930	Maxon	Oct. 2, 1894
543,871	Bain	Nov. 16, 1897
959,417	Anderson	May 24, 1910
962,257	Rockwell	June 21, 1910
1,001,340	Blauvelt	Aug. 22, 1911
1,023,855	King et al.	Apr. 23, 1912
1,077,862	Stafford et al.	Nov. 4, 1913
1,599,199	Bayles	Sept. 7, 1926
2,138,236	Horton	Nov. 29, 1938
2,239,893	Jackman	Apr. 29, 1941

FOREIGN PATENTS

102,931	Sweden	Aug. 28, 1941