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J. S. CLARKE.

APPARATUS FOR STEERING STEAMSHIPS AND OTHER VESSELS.

APPLICATION FILED JULY 22, 1907.

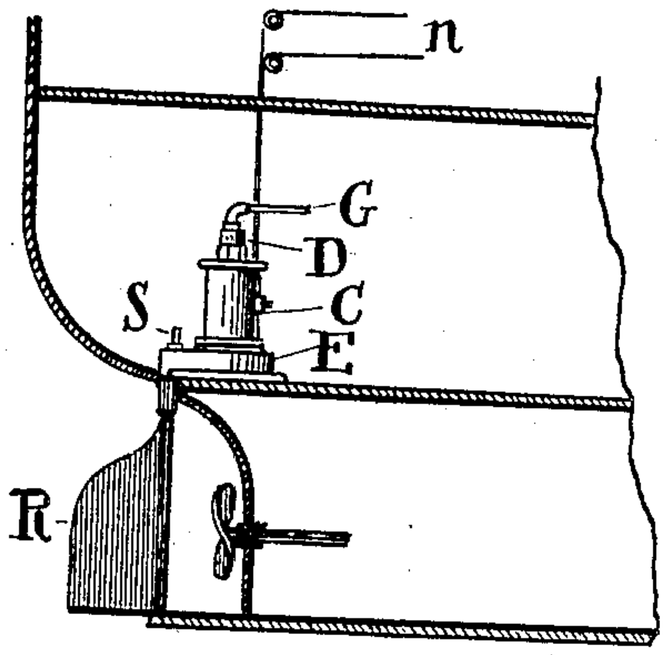


Fig. 1.

Fig. 2.

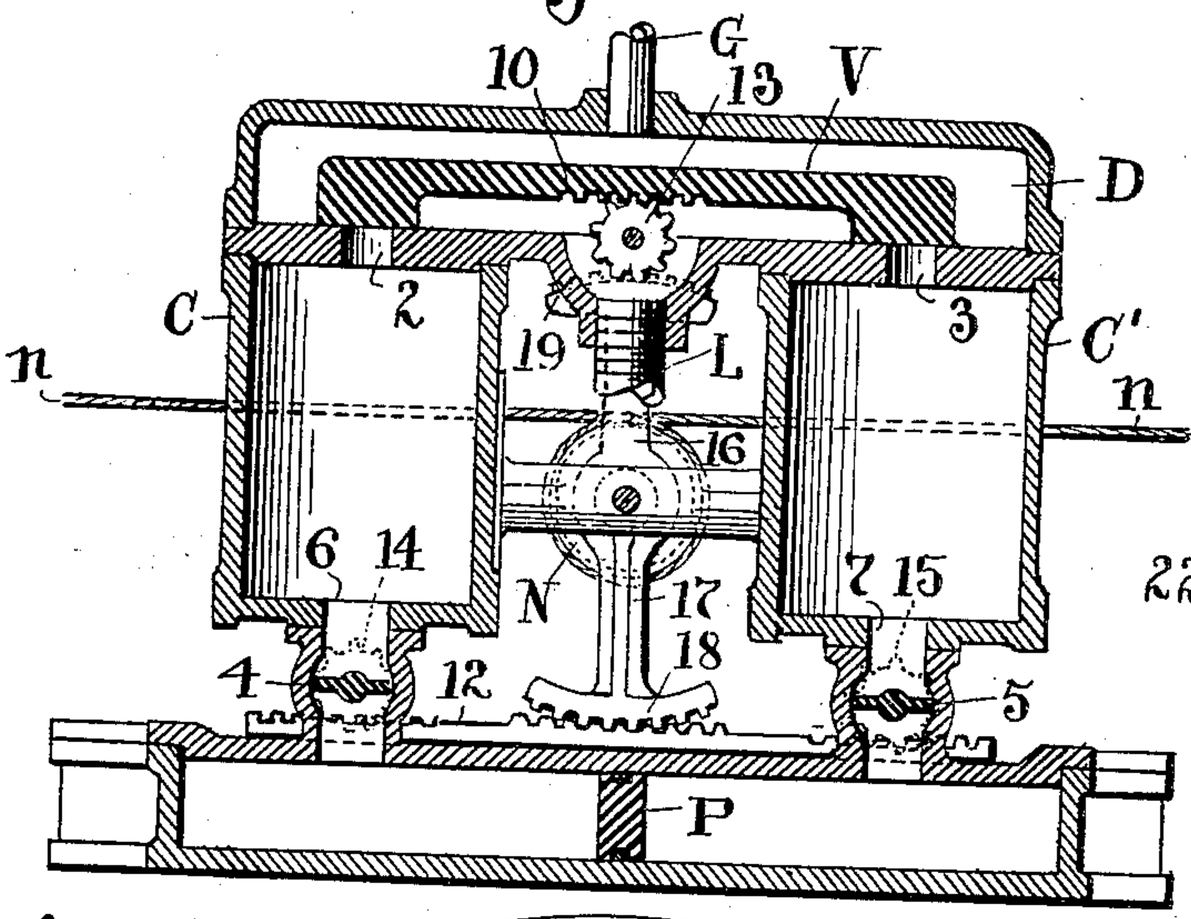


Fig. 3.

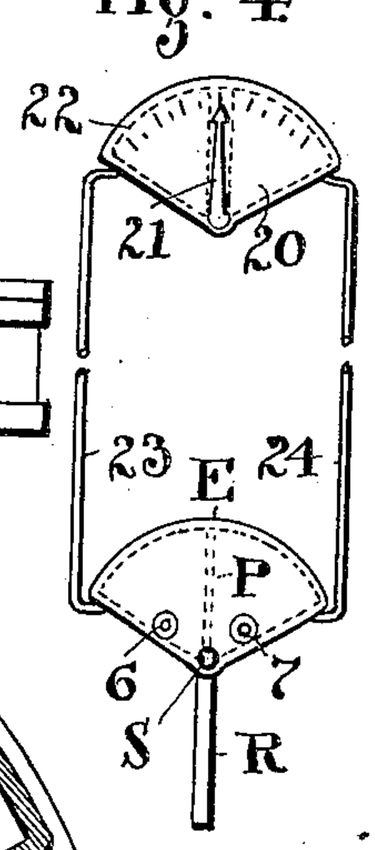
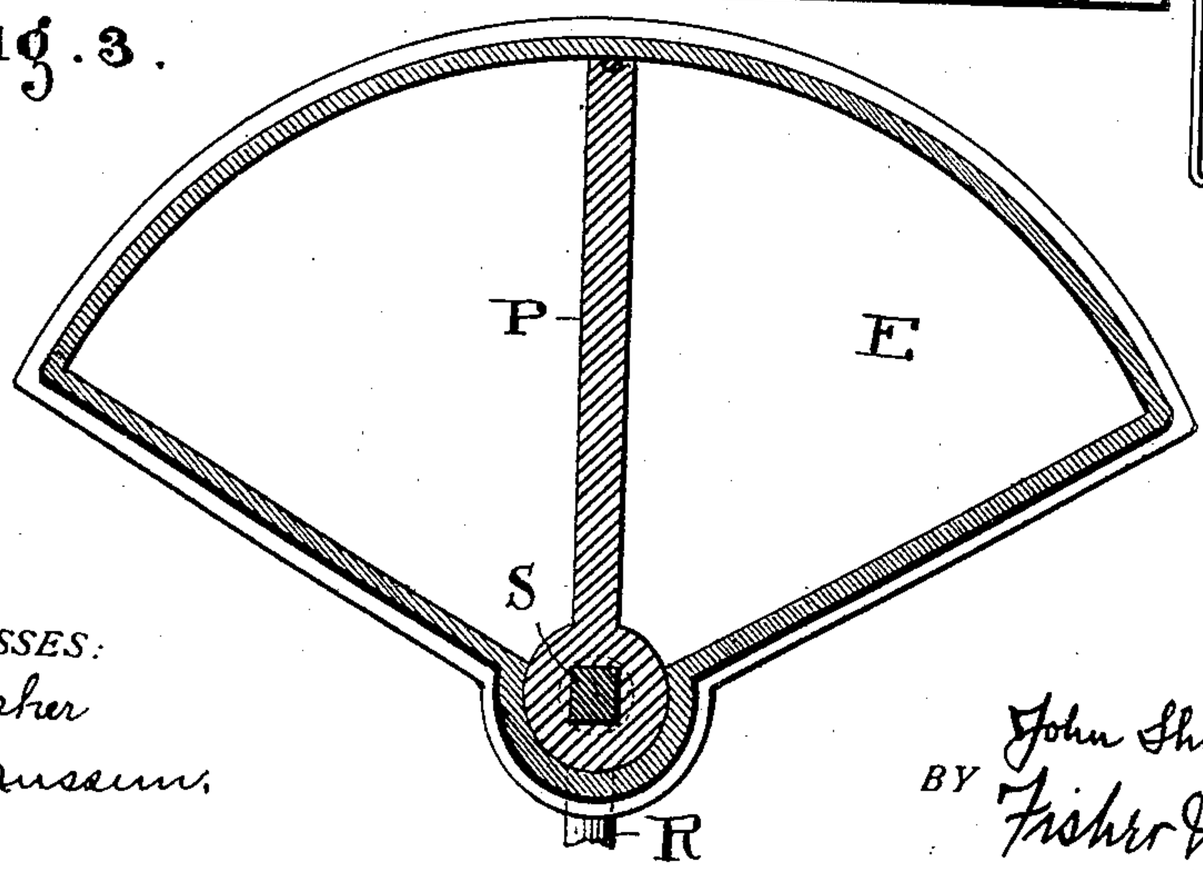


Fig. 4.



WITNESSES:
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UNITED STATES PATENT OFFICE.

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APPARATUS FOR STEERING STEAMSHIPS AND OTHER VESSELS.

No. 891,795. Specification of Letters Patent. Patented June 23, 1908.

Application filed July 22, 1907. Serial No. 385,031.

To all whom it may concern:

Be it known that I, JOHN SHURBON CLARKE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Apparatus for Steering Steamships and other Vessels, and do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an apparatus for steering steamships and other vessels.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional elevation of the rear portion of a boat or vessel showing a rudder and my new devices for controlling the same in elevation therein. Fig. 2 is an enlarged vertical sectional elevation of the cylinders and associated parts for governing the position of the rudder by fluid agencies. Fig. 3 is a plan view in section of the piston chamber and piston therein for governing the rudder. Fig. 4 shows one of the forms of pilot house indicators adapted to be used with this invention.

The chief embodiment of the invention is seen in Fig. 2, wherein are two cylinders C and C′, a valve chest or chamber D with a valve V therein, and a piston chamber E in which is a piston P. Now, remembering the objects of the machine as above recited, the said piston is designed to be fluid locked in any desired position according to the position rudder R is to hold for the time being, and the position of the rudder is changed according as the actuating fluid is thrown under steam pressure to one side or the other of rudder controlling piston P. The rudder shaft, S, is positively engaged in the pivot axis of the piston, so that as the piston is switched or thrown from one position to another in its chamber it will impart a corresponding movement to the rudder, and the piston chamber is quadrant shaped, in plan, to give the piston all the rotary sweep it requires to obtain the maximum movements of the rudder for steering purposes.

Valve chest or chamber D has a steam supply pipe G entering the same to obtain the desired pressure from the boiler or other source of supply, and openings or holes 2 and 3, respectively, admit fluid to the respective cylinders and are controlled by slide valve V. Chamber D is essentially a steam chamber, from which pressure may be exerted upon the liquid in either cylinder beneath according to the direction of movement to be imparted to piston P, and valves 4 and 5 in the respective passages 6 and 7 leading from said cylinders to the piston chamber are lock valves for the piston. That is, when closed, as shown in Fig. 2, the piston is positively fluid locked and cannot move in either direction regardless of fluid conditions in cylinders C and C′. Assume for example, that said cylinders are approximately half full of liquid and one possibly fuller than the other according to piston P in its chamber. By closing valves 4 and 5 the piston will be locked utterly regardless of the quantities of fluid higher up. Obviously, I seek to operate with such quantity of fluid in the cylinders that the piston chamber can be practically filled from either one and still leave a stand of fluid above the corresponding valve, 4 or 5. Should there be over flow the surplus will exhaust from beneath valve V, when opened through exhaust pipe L. Ordinarily, I do not operate with exhaust, but condensations of steam may in time fill up the cylinders so as to render relief necessary.

Conjoint operation of main valve V and lock valves 4 and 5 is obtained in this instance by means of drum N provided with an endless cable *n* or other means going to the pilot room, and racks 10 and 12 respectively operatively engaging with the respective valves V, 4 and 5 by pinions 13, 14 and 15, respectively, and rocking arms 16 and 17 having toothed segments 18 and 19 engaging said racks directly or through suitable pinions. Rack 10 is on valve V, and arms 16 and 17 are rigid with shaft of drum N, so that when said drum is rotated by the pilot through cable *n* wound about said drum the respective valves V, 4 and 5 will be correspondingly actuated and opened or closed. It follows that when either cylinder is opened to steam pressure through pipe G the other is opened to the exhaust and both piston locking valves 4 and 5 are opened likewise. On the other hand, when valve V is closed valves 4 and 5 are closed also. Now, referring to the means for communicating the positions of the rudder to the observation of the wheelman or pilot in the pilot house, two different indicators are shown. Thus, in Fig. 4 I show one in which the indicator has a quadrant shaped chamber 20 with a piston inside adapted to control an outside finger or pointer 21 which runs over a scale 22 about

the face of the quadrant, and pipes 23 and 24 respectively communicate between chamber 20 and piston chamber E, whereby equalization of pressure is maintained in indicator chamber 20 with piston chamber E, and pointer 21 will faithfully tell the corresponding position of the piston and rudder.

What I claim is:—

1. A steering mechanism for vessels operating with a liquid control and fluid pressure thereon comprising a quadrant shaped chamber adapted to be filled with liquid, a rudder shaft therein and a piston fixed on said shaft, in combination with means to operate said piston comprising a set of expansion chambers adapted each to be partially filled with liquid and pressure fluid respectively, passages connecting said cylinders with said piston chamber on opposite sides of said piston and a valve for each of said passages, pressure fluid inlet openings to the top of said expansion chambers and a slide valve to control said openings, and means to operate all said valves simultaneously comprising a rotatable member adapted to be operated by a cable and an arm controlled thereby, whereby the flow of liquid to and from said piston chamber and the flow of pressure fluid to and from said cylinders, respectively, are brought under a single control.

2. A steering apparatus comprising a quadrant shaped piston chamber, a piston adapted to oscillate therein and a post rotatable with said piston and projected through the wall of said chamber and a rudder thereon, in combination with two expansion chambers and passages therefrom into said piston chamber provided with valves, a fluid receiving chest over said expansion chambers and a valve in said chest controlling the flow of fluid to said chambers, and mechanism for simultaneously controlling all said valves comprising a rocker arm and parts engaged thereby operatively connected with said valves respectively.

3. A steering apparatus for the combined use of liquid and expansible fluid comprising a piston chamber and a piston therein, expansion chambers open to said piston chamber, a slide valve adapted to direct pressure fluid into either of said expansion chambers and to exhaust from the other at the same time, rotatable liquid locking valves in the passages from said chambers to said piston chamber, and mechanism to control said several valves comprising a rotatable drum, a rocking arm controlled thereby and means engaged by said arm adapted to operate all said valves simultaneously.

In testimony whereof I sign this specification in the presence of two witnesses.

JOHN SHURBON CLARKE.

Witnesses:
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