

(No Model.)

J. RUSSELL.  
STEAM STEERING GEAR.

No. 465,730.

Patented Dec. 22, 1891.

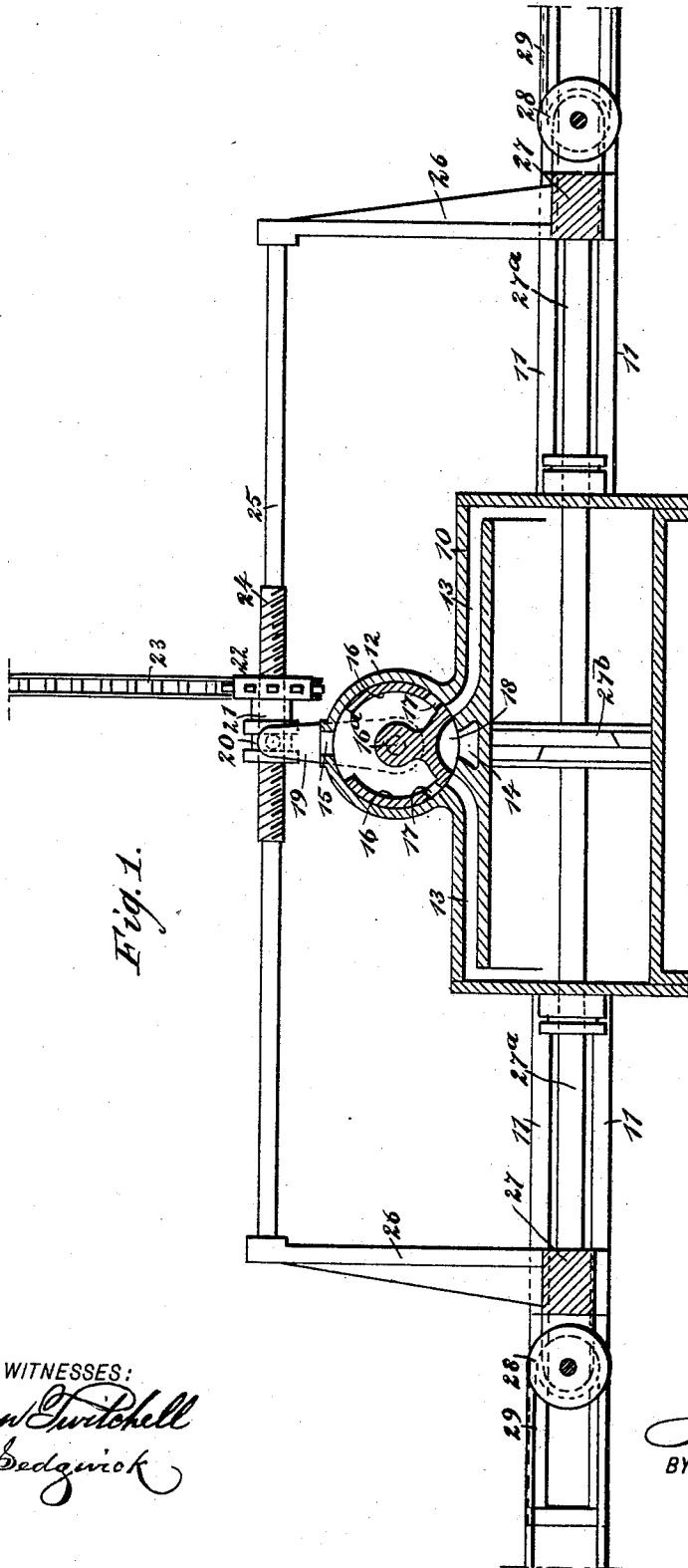


Fig. 1.

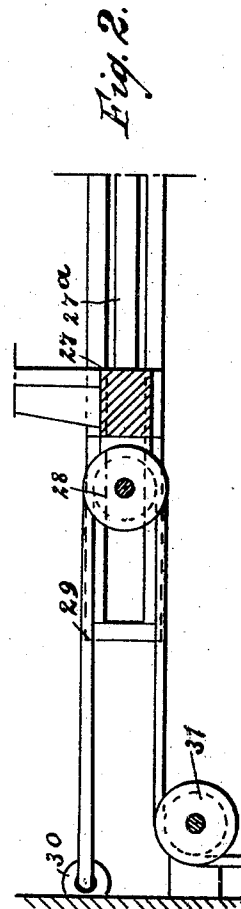


Fig. 2.

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# UNITED STATES PATENT OFFICE.

JOHN RUSSELL, OF LONG ISLAND CITY, NEW YORK.

## STEAM STEERING-GEAR.

SPECIFICATION forming part of Letters Patent No. 465,730, dated December 22, 1891.

Application filed June 8, 1891. Serial No. 395,445. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN RUSSELL, of Long Island City, in the county of Queens and State of New York, have invented a new and Improved Steam Steering-Gear, of which the following is a full, clear, and exact description.

My invention relates to improvements in the steering apparatus of vessels, and the object of my invention is to produce a simple device which is operated by steam and controlled by hand, and by means of which the vessel's course may be nicely regulated.

To this end my invention consists in certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in both views.

Figure 1 is a sectional view, partly in elevation, showing the general arrangement of the apparatus; and Fig. 2 is a detail view, showing the manner in which the tiller-ropes are connected with the movable piston to increase the throw of the ropes.

The steam-cylinder 10 is held upon suitable supports 11, which also serve as guides for the piston-rods, and on one side of the piston is a cylindrical steam-chest 12, from which ports 13 lead into opposite ends of the cylinder, and the cylinder is also provided with a common form of exhaust-port 14, which is located at the center and which has communication with the steam-chest valve. The steam-chest 12 has a suitable inlet 15, and within it is a cylindrical oscillating valve 16, which is pivoted in the center, as shown at 16<sup>a</sup>, which has ports 17, adapted to align with the ports 13 of the cylinder, and which has an exhaust-port 18 to align with one of the ports 13 and with the exhaust-port 14 of the cylinder. The valve-stem 19 of the valve 16 is connected at its outer end with a nut 21, which has a groove 20 to receive a stud on the valve-stem, and which has also a sprocket-wheel 22, which is operated by a chain 23, and this chain may be extended to the pilot-house and connected with the ordinary hand-wheel, so that when the wheel is turned the chain will turn the sprocket-wheel 22 and nut 21. The nut 21 fits the threaded portion 24 of a rod 25,

which rod extends parallel with the cylinder 10, and is provided at its ends with arms 26, connecting with the cross-heads 27, which are arranged at opposite ends of the cylinder 10 and are held to move on the guide-rods 11. It will thus be seen that the cross-heads 27, the arms 26, and the rod 25 form a carriage, and all the parts will be moved in unison. A piston-rod 27<sup>a</sup> leads through the ends of the cylinder from the cross-heads 27, and the piston-rod is connected centrally to a piston 27<sup>b</sup>, which moves in the cylinder 10. Each cross-head 27 carries a pulley 28, over which a tiller-rope 29 extends, one end of the rope being secured to a fixed support, as shown at 30, and after the rope passes the pulley 28 it is made to extend over a pulley 31, which is arranged beneath and opposite the fixed point 30, and it will thus be seen that when the pulley 28 is moved with the cross-head the throw of the rope will be greater than the movement of the cross-head. These tiller-ropes 29 are arranged at each end of the cylinder, as shown, and it will be readily seen that when one rope is moved in one direction the opposite rope will be moved in the opposite direction, and, as a result, the rudder will be easily operated.

The operation of the apparatus is as follows: As shown in Fig. 1, the steam is cut off from the cylinder 10 and the piston 27<sup>b</sup> is arranged centrally in the cylinder. To steer the vessel the operator in the pilot-house turns the hand-wheel, thus moving the nut 21 by means of the sprocket wheel and chain connection, and the valve 16 will be turned so as to admit steam to one end of the cylinder. At the same time it will bring the exhaust-port of the valve opposite the main port in the opposite end of the cylinder, so that the cylinder may exhaust, and when the valve is turned to admit steam the piston will be moved, thus operating the tiller-ropes and turning the rudder, and as soon as the piston moves the cross-heads 27 and rod 25 will be moved, thus actuating the valve-stem and cutting off the steam-supply. The operator then throws the wheel again, thus opening the steam-port once more and the apparatus again automatically cuts off the steam-supply, and it will be observed that the steersman operates the wheel just as if he were

steering by hand, as it is necessary to keep throwing it in order to keep the steam-port of the cylinder open for the inlet of steam.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A steam steering apparatus comprising a steam-cylinder having end ports, a movable piston, and piston-rods extending through opposite ends of the cylinder, a steam-chest connected with the cylinder and provided with a suitable valve, cross-heads arranged at opposite ends of the piston-rod, said cross-heads having laterally-extending arms connected by a rod, said rod having a central threaded portion, a nut mounted on the threaded portion of the rod and having connection with the valve-stem of the valve, means for operating the nut from the pilot-house, pulleys carried by the cross-heads, and tiller-ropes carried by the pulleys and adapted to operate the rudder, substantially as described.

2. A steering apparatus comprising the steam-cylinder, a piston having oppositely-projecting rods, a chest and valve therefor, a

rudder-operating carriage connecting the two piston-rods and having a threaded portion provided with a nut connected to the valve-stem, and means for operating the nut from the pilot-house independent of its operation by the said carriage, substantially as set forth.

3. A steam steering apparatus comprising a steam-cylinder having a steam-chest on one side, a rotary valve mounted in the steam-chest and provided with ports adapted to align with the ports of the steam-cylinder and with a laterally extending stem, a piston held to slide in the cylinder, a double piston-rod extending through the ends of the cylinder, a carriage connected with the piston-rod and provided with pulleys which carry the tiller-ropes, a revoluble nut mounted on a threaded rod of the carriage and connected with the valve-stem, and a sprocket wheel and chain connection between the nut and the pilot-house, substantially as described.

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Witnesses:

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