

C. C. R. DE CARVALHO.
SHIP PROPELLING DEVICE.
APPLICATION FILED MAR. 2, 1909.

945,263.

Patented Jan. 4, 1910.

Fig. 1.

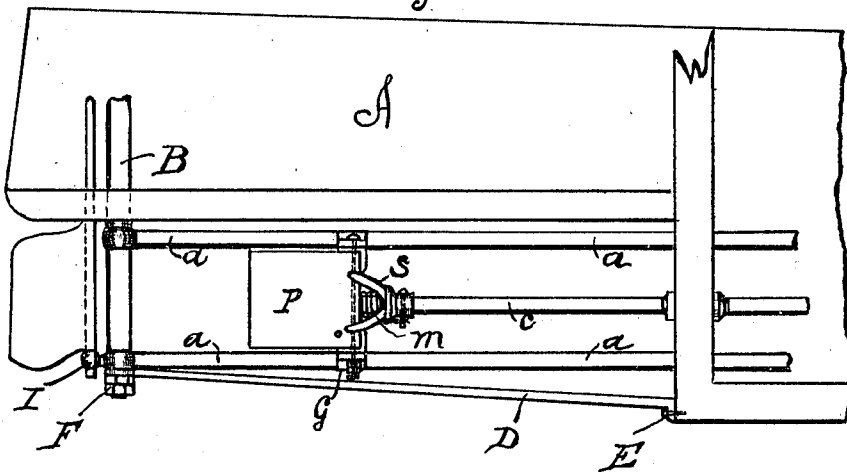


Fig. 2.

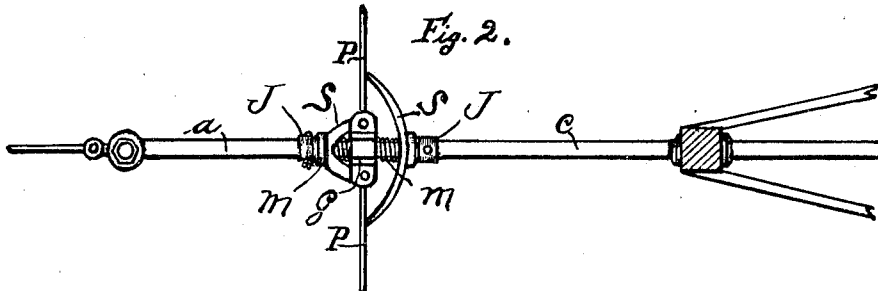


Fig. 4.

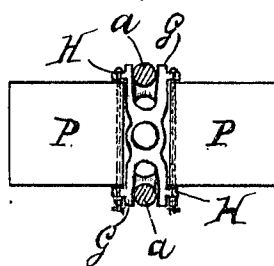


Fig. 3.



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UNITED STATES PATENT OFFICE.

CARLOS CONSTANTINO ROCHA DE CARVALHO, OF LISBON, PORTUGAL.

SHIP-PROPELLING DEVICE.

945,263.

Specification of Letters Patent.

Patented Jan. 4, 1910.

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To all whom it may concern:

Be it known that I, CARLOS CONSTANTINO ROCHA DE CARVALHO, a subject of the King of Portugal, and resident of Lisbon, Portugal, have invented certain new and useful Improvements in Ship-Propelling Devices, of which the following is a specification.

This invention relates to a new device for propelling steam ships.

According to the present invention the screw propeller in use until now is replaced by propelling blades which are adapted to move in such a manner that during the first half of each double stroke they are open and resist the water with their entire surface while they fold together before the backward stroke, thus greatly reducing the negative resistance.

In the accompanying drawings: Figure 1 is a side elevation showing the stern part of a ship provided with a propelling device constructed according to the principles of the present invention; Fig. 2 is a longitudinal section passing through the propelling shaft of the actuating mechanism the latter being rotated 90 degrees and the propelling blades opened. Fig. 3 is a plan view of one of the cross beams. Fig. 4 is a vertical sectional view of the propelling mechanism showing the manner of securing the propelling blades to their frame.

In these figures A designates the stern of a ship's body; connected with the latter in any suitable manner are two parallel guide rails *a* between which an H-shaped frame G is slidably guided; through the middle bore of this frame G (see Fig. 4) a driving rod *c* is passed which directly receives a reciprocating motion from the piston of the steam engine arranged inside the ship's body or in any other suitable manner.

As shown in Fig. 1, the rails *a* are passed through one of the rear, vertical timbers and mounted at their rear ends upon the vertical brace bar B, provided with a brace rod D, which is secured to the timbers at E and held in connection with the lower rail *a* upon the bar B by means of nuts or the like F and the said lower rail is further provided with a rearwardly extended bearing arm I for the rudder post.

The frame G is mounted on balls with

the object of realizing an easy rolling in the guides and of reducing the frictional losses.

Mounted on the flanges H of the frame through the instrumentality of vertical pivots which are secured at the top and at the bottom by means of nuts and wedges are the propelling blades P and P (Fig. 4).

The frame G and the propelling blades P secured thereto are held with a certain play on the end of the propelling rod *c* by means of spiral springs *m*, *m* between two cross arms S, S; the latter (Fig. 3) are arranged in front and behind the frame G on the driving rod *c* and are provided with sleeves J, by which they are rigidly connected thereto.

The function of the present invention is as follows:—During the first half of each double stroke (see Fig. 2) the frame G is pushed forward in the guides *a*, *a*, the propelling blades P being held open against the resistance of the water by the horizontally arranged curved cross arm S so that the ship is propelled forward by the pressure of reaction. When the blades move backward the blades P fold together over the cross arm S which has to be considered as being vertically placed in Fig. 1, so that the resistance of water opposed to this motion becomes as much reduced as possible.

When it is desired to reverse the direction of motion of the ship, the propelling rod *c* is rotated 90 degrees so that the previously horizontally directed cross arm now assumes the vertical position and the previously vertical cross arm assumes the horizontal position, whereby the propelling blades are allowed to fold together in the opposite direction.

The advantages of the propelling device forming the subject matter of the present invention reside in the following: The motive power of the engine piston is directly converted into a reciprocating motion, the driving mechanism is therefore not exposed to torsional strain and the efficiency of the engine is improved. Furthermore, the tendency of the ship to turn sidewise which very often has been experienced when the ship is propelled by means of screw propellers, is done away with as the ship now makes an absolutely rectilinear way. Fur-

thermore it is well known that the screw propeller is very cumbersome when the ship is propelled at times by sail or when the ship is towed. The device which forms the subject matter of this invention does not show these drawbacks as the propelling blades when folded do in no way hinder the motion of the ship.

A final advantage of the device resides in the fact that it is possible especially when there is a danger of collision to stop the ship very rapidly by actuating the propelling blades in the reverse manner.

It will be understood that the above described form has been given by way of example and that the invention may be carried out in various forms. The described system can be constructed single or double and be arranged at different places in the ship other than at the stern and in particular adjacent the stern.

If the propelling mechanism according to the present invention is constructed so as to correspond to the size of the ship and if the ship's engine has a sufficient strength and rotates at the desired speed it will no doubt be possible to realize and maintain the speed of 30-40 sea miles, or in other terms, as it will be possible to cover the same distance in one third of the time actually required and this by using only one third of the amount of fuel necessary now, the radius of action of ships is greatly increased.

Having now fully described my said invention, what I claim and desire to secure by Letters Patent, is:—

1. In a ship, the combination with a ship's hull, of a substantially horizontal shaft, a frame carried by said shaft, means for slidably supporting said frame, means for reciprocating said shaft, propeller blades pivotally carried by the frame and means whereby the rotation of the propelling shaft 90 degrees will reverse the action of the blades.

2. In a ship the combination with the ship's hull of a substantially horizontal shaft, means for guiding the said shaft tightly in the ship's hull, means arranged inside the ship's hull for reciprocating the said shaft, two elongated curved abutments secured to the said shaft the one to the outer end of it, the other at an interval from the first one and in such a manner that it forms right angles with the first one, an H shaped carrier having forks at its top and bottom ends and a central hole, this carrier being engaged with its central hole on said shaft between the said two abutments, a coiled spring arranged on each side of said carrier between the latter and the said abutments and surrounding the said shaft; guide rods secured to the ship's hull so as to be parallel to the said shaft and adapted to be engaged

by the terminal forks of said carrier, anti-friction rollers between the said forks and the said guide rods, flanges on the outer sides of each of the forks of the carrier, holes in the said flanges, a vertical bolt passed through corresponding holes of two superposed flanges, means for securing the said bolts to the said flanges a wing engaged by the said bolts so as to be adapted to oscillate on said carrier, and means for rotating the said shaft in spite of its reciprocating motion 90 degrees and holding it in its adjusted positions so as to bring the one or the other of said elongated abutments athwart the said wings, substantially as and for the purpose set forth.

3. A propelling mechanism for ships, comprising a frame slidably mounted, propeller blades pivotally mounted on said frame, means for reciprocating said frame and propeller blades and means whereby the rotation of said reciprocating means 90 degrees, will reverse the action of the blades.

4. In a ship, the combination with the ship's hull, of guides carried thereby and suitably braced, a frame slidable in said guides, flanges on said frame, blades pivotally mounted within said flanges, a propeller shaft for said frame and propeller blades, said shaft being capable of reciprocating motion and means whereby the rotation of said shaft 90 degrees will reverse the action of the propeller blades.

5. In a ship, the combination with the ship's hull, of guides comprising parallel spaced rods carried thereby, means for bracing said guides, an H-shaped frame slidably mounted between said rods, bearings for said frame, propeller blades pivotally carried by the frame, a reciprocating propeller shaft to which said frame is secured, and cross arms rigidly mounted on either side of the propeller blades and so disposed that a rotation of the shaft 90 degrees will reverse the action of the propeller blades.

6. In a ship, the combination with the ship's hull, of guides carried thereby, a propeller shaft capable of reciprocating motion, a frame slidable in said guides, cross arms rigidly mounted on the shaft, on either side of the frame and resilient means between said frame and cross arms.

7. In a ship, the combination with the ship's hull, of guides rigidly supported, a propeller shaft capable of reciprocating motion, a frame journaled in sliding engagement with said guides, and mounted on said shaft, propeller blades pivotally mounted on the frame, cross arms rigidly secured to the shaft on either side of the frame, said cross arms being disposed at right-angles to each other and springs disposed on said shaft between said frame and cross arms.

8. A propelling mechanism for ships comprising a frame, means for slidably supporting said frame, propeller blades pivotally mounted on said frame, a shaft disposed between said blades and resilient means disposed around the shaft and on either side of the propeller blades.

In testimony whereof I have hereunto set my hand in presence of two witnesses.

CARLOS CONSTANTINO ROCHA DE CARVALHO.

Witnesses:

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CHAS. F. LA SERRE.