

W. D. Wilson.
Vibrating Propeller.

Patented Dec. 19, 1865.

N^o 51,640.

Fig. 1.

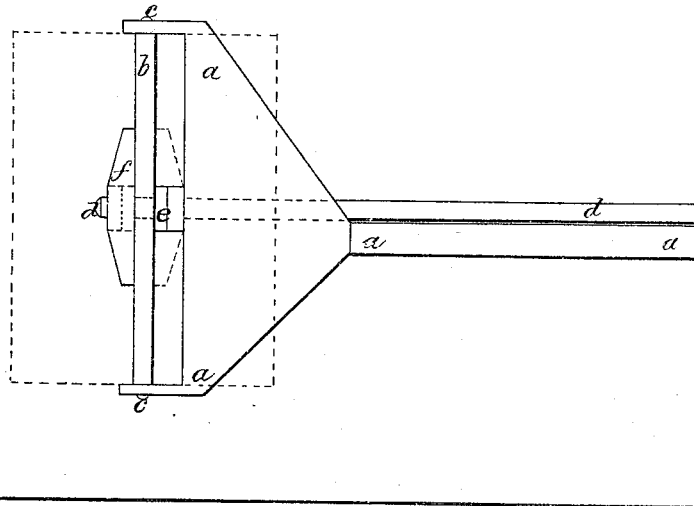
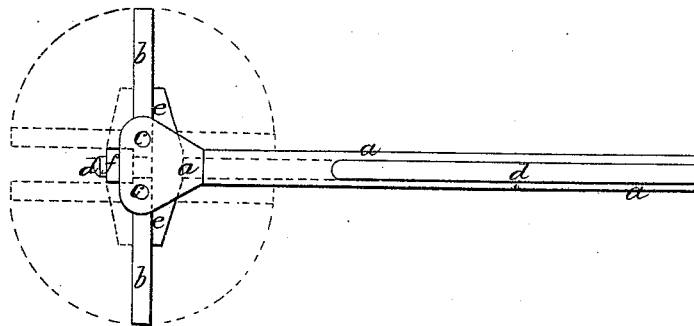


Fig. 2.



Witnesses;
Thomas Day

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UNITED STATES PATENT OFFICE.

WILLIAM D. WILSON, OF NEWARK, NEW JERSEY.

IMPROVED MARINE-PROPELLER.

Specification forming part of Letters Patent No. 51,640, dated December 19, 1865.

all whom it may concern:

Be it known that I, WILLIAM D. WILSON, of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Instruments for Marine Propulsion; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to accompanying drawings, making a part of this specification, and to the letters of reference marked thereon.

The means commonly used for applying the power for marine propulsion hitherto have each had peculiar disadvantages, by which a portion of the power has been wasted. The radial action of the paddle-wheel, by which the paddle at the moment of entering and leaving the water, at an angle of forty-five degrees, for instance, has involved a loss of half the power applied at those points, is a familiar example, and the remedy that has been applied to this waste of power by the radial wheel, consisting of various appliances for causing the paddle to enter and leave the water in a vertical direction, has also been found useless in ocean navigation, which necessarily includes the conditions of varying and deep immersions, as may be simply illustrated by the extreme consideration of immersion to the shaft when it is obvious that the entering paddle would not only be of no propulsive value, but would oppose its entire area to the progress of the vessel. In a similar manner the various patterns of the screw-propeller designed to counteract or avoid the losses of power incident to angular and centrifugal action, friction of the helicoidal surface, interference of the blades or the arms carrying the blades, and other causes of loss of power, have been and are still so numerous and different that in the aggregate they fully indicate that the instrument itself must be founded upon an incorrect principle.

The object of my invention is to apply the propelling power of a vessel directly in the line of progress without radial or angular action, and in such a manner that the direction of motion may be instantly and easily reversed.

To accomplish the first feature of this object, my invention consists in mounting upon a shaft that extends from the vessel parallel to the keel a pair of vanes that are at right angles to the shaft and oppose their entire area

to the water, when projected backward, and that collapse toward the shaft, and present only their edges when the shaft is withdrawn to the vessel in preparation for another stroke. If the shaft of the propelling-vanes be attached directly to the piston of the engine, the steam on the forward side of the piston reacts in a rectilinear direction against the water, behind the open faces of the propelling-vanes, and thus forces the vessel ahead with only the slight loss of power due to the friction of the piston and piston-rod or shaft, and in making the return-stroke the vanes collapse or turn back toward the shaft so as to present merely their edges in passing through the water; and to enable the direction of the propulsion to be changed, the stops that prevent the vanes opening beyond a right angle to the shaft are placed on a secondary shaft, by which they may be turned, so that they pass between the vanes instead of extending behind them. By turning this secondary shaft one-quarter way round, therefore, the outward stroke of the propelling-shaft causes the vanes to collapse forward toward the shaft, and the return-stroke, that retracts the shaft, again opens the vanes until they arrive at right angles to the shaft, when they strike upon another pair of stops similar to those first mentioned and placed upon the same shaft. A quarter-turn of this secondary shaft, therefore, determines the direction of the opening and the consequent action of the propelling-vanes.

To enable others skilled in the arts to which it appertains to make and use my invention, I will proceed to describe its construction and operation with reference to the drawings.

Figure 1 is a side elevation of the instrument or apparatus placed under one of the quarters of a vessel, as indicated by the marginal line; and Fig. 2 is a plan of the same. The dotted black lines show the position assumed by the vanes when the propeller is retracted, and the red lines indicate the position of the parts when it is prepared for backing.

The head of the propeller-shaft *a* carries the vanes *b b* by the joints or pivots *c c*, so that the vanes are each free to swing through the semicircle outward from the shaft.

The supplemental or reversing shaft *d* is free to turn through a quarter-circle in the head of the propeller-shaft by which it is car-

ried, and it is provided with the stops *e* and *f*, placed at right angles with each other and firmly secured in such a manner that when their shaft is turned a quarter round they will either extend behind the vanes or lie between them. As represented by the black lines in the drawings, the stop *e* prevents the vanes swinging forward on the shaft, and consequently when the shaft is thrust outward from the vessel the vanes are held open by the stop and react against the water for the propulsion of the vessel; but when the shaft is retracted they swing back toward it and lie in the line of progression. In a similar manner, as represented in red lines, when it is desired to back, the aftermost stops *f* may be turned across the vanes, so that the latter are supported or restrained when the shaft is retracted, and are collapsed when it is forced outward.

As the propelling-vanes thus naturally adapt themselves to present merely the slight resistance of their edges to the water when they are not in use, this instrument has the important advantage of offering but little resistance when the vessel is under sail alone, and does not require, therefore, any apparatus similar to that sometimes applied with the screw to hoist it out of water, and there is no necessity for removing any of its parts like there is for taking off the immersed paddles of wheels.

Having thus described and illustrated the character of my invention, I would remark that, where a higher speed of the vessel is desired than would be consistent with the speed of the piston, the propelling-shaft may be driven from the outer end of a lever, to which the

engine is connected at an intermediate point, or it may be otherwise geared.

A single propeller may be used at or near the center line with a specially-adapted rudder; or a pair or set of propellers may be used on each side, which may be advantageously driven by placing them on the opposite ends of a lever or beam, so that one of them may be thrusting while the other is being withdrawn, by which arrangement the power may be uniformly applied in the forward and return strokes of the engine.

Instead of hanging the propelling-vanes by joints or pivots placed near to one edge, they may be hung but a little out of the center, so that there may be but sufficient preponderance on one side to insure their opening properly.

By this means also a large portion of the strain may be removed from the stops and reversing-shaft to the main propelling-shaft.

The reversing-shaft carrying the stops may be turned to reverse the motion of the vessel by a hand lever or gearing, or in any other convenient manner, and both shafts may be projected astern of the propeller to rest in suitable supports affixed to the stern-post or other convenient part of the vessel for that purpose.

I claim as my invention and desire to secure by Letters Patent—

The combination of the propelling shaft and vanes and the reversing shaft and stops, substantially as described.

W. D. WILSON.

Witnesses:

THOMAS DAY,
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