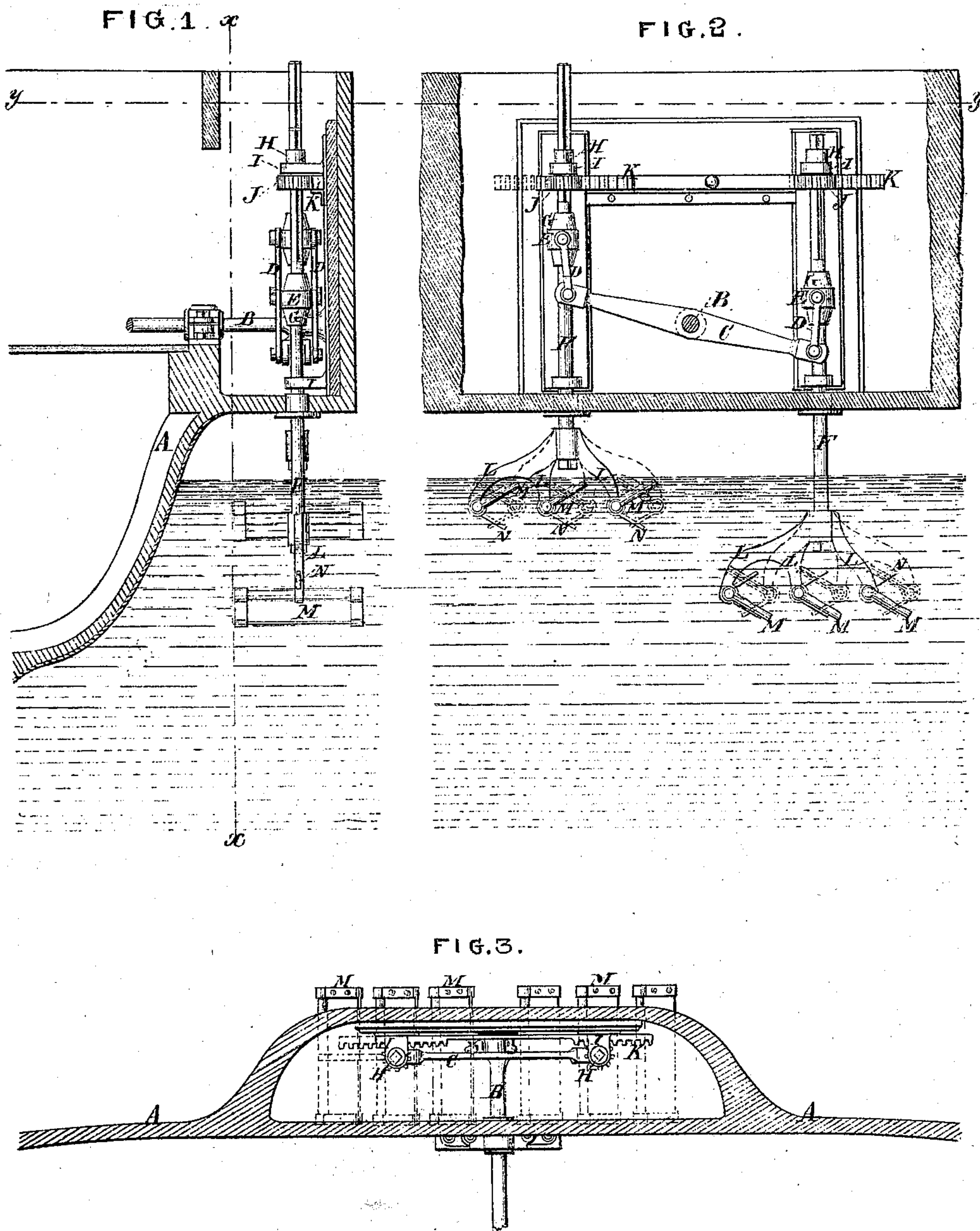


C. A. S. Harris,

Vib. Propeller.

No. 113,163.

Patented Mar. 28. 1871.



WITNESSES.

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CALVIN A. S. HARRIS, OF ST. LOUIS, MISSOURI.

Letters Patent No. 113,163, dated March 28, 1871; antedated March 21, 1871.

IMPROVEMENT IN PROPELLERS FOR VESSELS.

The Schedule referred to in these Letters Patent and making part of the same.

I, CALVIN A. S. HARRIS, of the city and county of St. Louis, in the State of Missouri, have invented a new and useful Improvement in Propellers for Vessels, of which the following is a specification.

Nature and Objects of the Invention.

My propellers are constructed with a series of blades pivoted to arms, which receive a reciprocating movement in a vertical or approximately vertical plane.

Suitable stops are provided to so limit the motion of the blades upon their respective pivots that, under the resistance of the water, they will assume oblique positions, adapting them to produce the required propelling effect at each upward and each downward stroke.

The said propellers are mounted in pairs by means of a connecting-beam, so that as one moves up another moves down, by which means the motion is rendered more uniform, and any rocking effect upon the vessel prevented.

The reciprocating-rods or shafts which carry the propellers are made to rotate within their bearings, or other suitable means may be provided for the purpose of reversing the propellers, as required, to move the vessel in either direction.

It is my intention to use my propellers either at the sides or stern of a vessel, or, under some circumstances, they may be applied at the bow.

Description of the Accompanying Drawing.

Figure 1 is a vertical section, showing one side of a vessel with my invention applied.

Figure 2 is a vertical longitudinal section at $x x$, fig. 1.

Figure 3 is a horizontal section at $y y$, figs. 1 and 2.

General Description.

A represents a part of the ship's side.

B is a shaft, to which a reciprocating motion may be imparted by one or more reciprocating-engines, through the medium of a rack and pinion, crank-arm, or other known means. This shaft may extend completely across the vessel, or separate short shafts may be used, one on each side.

A beam, C, is firmly keyed upon the shaft B, so as to receive a reciprocating motion therefrom, and is connected at its ends by links, D D, to sleeves, E E which are so mounted on the vertical rods F F as to

impart a vertical reciprocating motion thereto, but permit the rotation of each of the said rods upon its axis.

For this purpose the sleeves E are fitted between collars, G G, keyed or forged upon the rods F, or otherwise firmly secured thereto.

The rods F are of square or other non-circular form toward their upper ends, where they pass through the guides H H, which guides are made in the form of sleeves, mounted in brackets I I, and provided with pinions J J, for the purpose of rotating them and, by their means, the rods F, when necessary to reverse the propellers.

This rotary movement may be imparted by a hand-lever, connected with a rack, K, which gears with the pinions J J, or by other means.

The rods F constitute the propeller-shafts, and are provided at their lower ends with any desirable number of projecting arms, L L L, to which are pivoted the blades M M M, studs or stops, N N, being employed above and below to arrest the swinging movement of the blade and retain it in an oblique position, as shown in fig. 2.

Operation.

A rocking motion being imparted to the shaft B, and from it to the beam C, the rods or shafts F are driven up and down, as before stated. The arrows indicate the directions in which they are supposed to be moving in the present illustration, and the positions which the blades or buckets M are caused to assume by the resistance of the water. This oblique position will manifestly cause said blades to impart a strong propelling force to the vessel.

The two propellers on either side of the vessel may be reversed at any moment, and by adjusting those on one side oppositely from those on the other the vessel may be readily turned within her own length.

Claim.

I claim as my invention—

The vertical-guided shafts F F, reciprocated in the manner set forth, and carrying arms L and pivoted blades M, as herein shown and described.

C. A. S. HARRIS.

Witnesses:

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