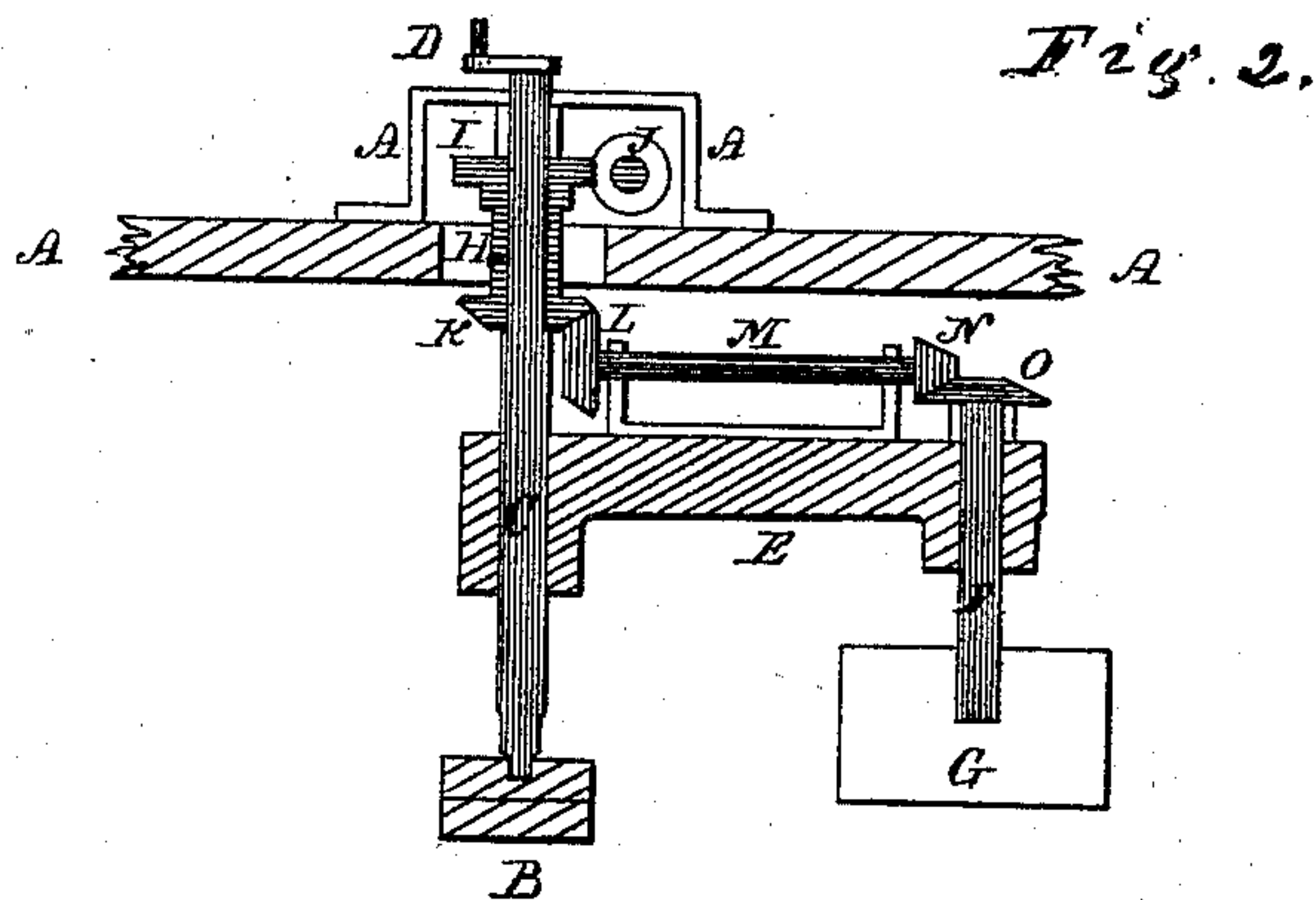
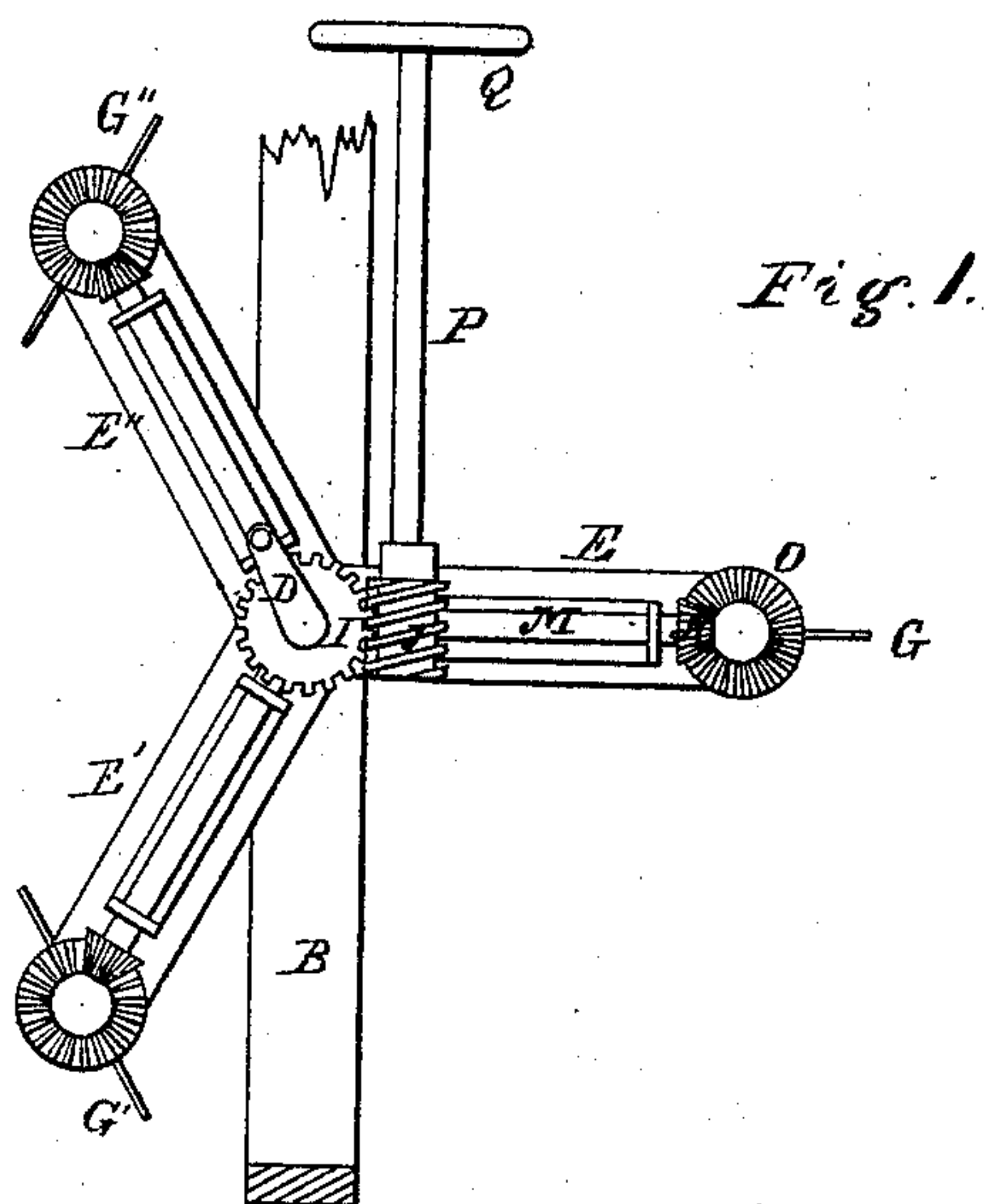


I. T. PAYNE.
STEERING-PROPELLER.

No. 171,313.

Patented Dec. 21, 1875.



Witnesses.

Inventor.

Wendell B. Smith
John J. Peters

Ira J. Payne
by Theo. G. Ellis, Attorney.

UNITED STATES PATENT OFFICE.

IRA T. PAYNE, OF ESSEX, CONNECTICUT.

IMPROVEMENT IN STEERING-PROPELLERS.

Specification forming part of Letters Patent No. **171,313**, dated December 21, 1875; application filed August 16, 1875.

To all whom it may concern:

Be it known that I, IRA T. PAYNE, of Essex, in the county of Middlesex and State of Connecticut, have invented certain new and useful Improvements in Steering-Propellers; and I do hereby declare that the following is a full, clear, and exact description thereof, whereby a person skilled in the art can make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Like letters in the figures indicate the same parts.

My invention relates to that class of propellers for vessels in which the blades are placed in a vertical position, and, by suitable mechanism which adjusts them in different positions, can be made to propel the vessel in any desired direction, the blades being feathered in one direction, while they press flat against the water in the opposite direction.

My invention consists in a new mechanism for operating the blades.

In the accompanying drawing, Figure 1 shows a top view of my improved propeller. Fig. 2 shows a section through the arm and blade at right angles to the keel of the boat.

A is the deck or upper support of the propeller-shaft. B is the keel of the boat or lower bearing of the said shaft. C is the propeller-shaft. It is shown in the drawings as receiving a rotary motion, by means of a crank, D, at its upper end. E E' E'' is a solid frame, consisting of three arms, united at the center, and firmly keyed to the shaft C, so as to turn with it. At the ends of the arms are vertical bearings, in which the vertical spindles F, attached to the blades G, turn. H is a barrel, fitted upon the propeller-shaft C, and in which it revolves. At the upper end of H is fixed the spur-wheel I, and at its lower end the bevel-gear K. Upon each of the arms E is a horizontal spindle, M, working in journals upon the arm near its ends. Upon the inner end of this spindle is a bevel-gear wheel, L, running in the wheel K, and upon its outer end is another bevel-gear, running in the wheel O, upon the upper end of the blade-spindle F.

The proportions of these wheels must be such that the product of the number of teeth

in the wheels L and O must be double the product of the number of teeth in K and N. Thus, the wheels K, L, and O may have the same number of teeth, and N half as many. This is for the purpose of rotating the blade G through a half-turn, while the arm E makes a complete circle. The wheel I gears into the worm J, which is placed upon the end of the rod P. This rod runs in fixed bearings upon the deck of the vessel, and is turned by the steering-wheel Q.

When not used in steering, the worm J holds the wheel I firmly in place.

The operation of my invention is as follows: A rotary motion is given to the shaft C, and the arms E revolve, carrying with them the blades G. The wheels L roll upon the wheel K, which is held in position, and give motion to the wheels N and O through the spindles M. This turns the blades G so that they press flat against the water in one direction, and are feathered when moving in the opposite direction; while in the intermediate positions they operate diagonally to propel the vessel in the same direction as when the flat side is presented to the water.

As the direction in which the blades act is dependent upon the wheel K, by turning this wheel the line of propulsion is changed. This is done by means of the wheel Q and worm J, and serves as a steering apparatus without a rudder.

If, when the boat is propelled directly forward, the direction of motion is marked upon the wheel I, then in whatever direction this line is turned the propeller will act. If turned half-round, the vessel will back without stopping the propeller.

In the drawings the devices L M N O are shown outside of the arm E. They may, however, be placed within it, and thereby removed from exposure to accident.

What I claim as my invention is—

The devices K L M N O in combination with the revolving arm E and the steering devices H I J, for altering the position of the wheel K, substantially as and for the purposes herein described.

IRA T. PAYNE.

Witnesses:

HENRY L. PRATT,
CARNOT O. SPENCER.