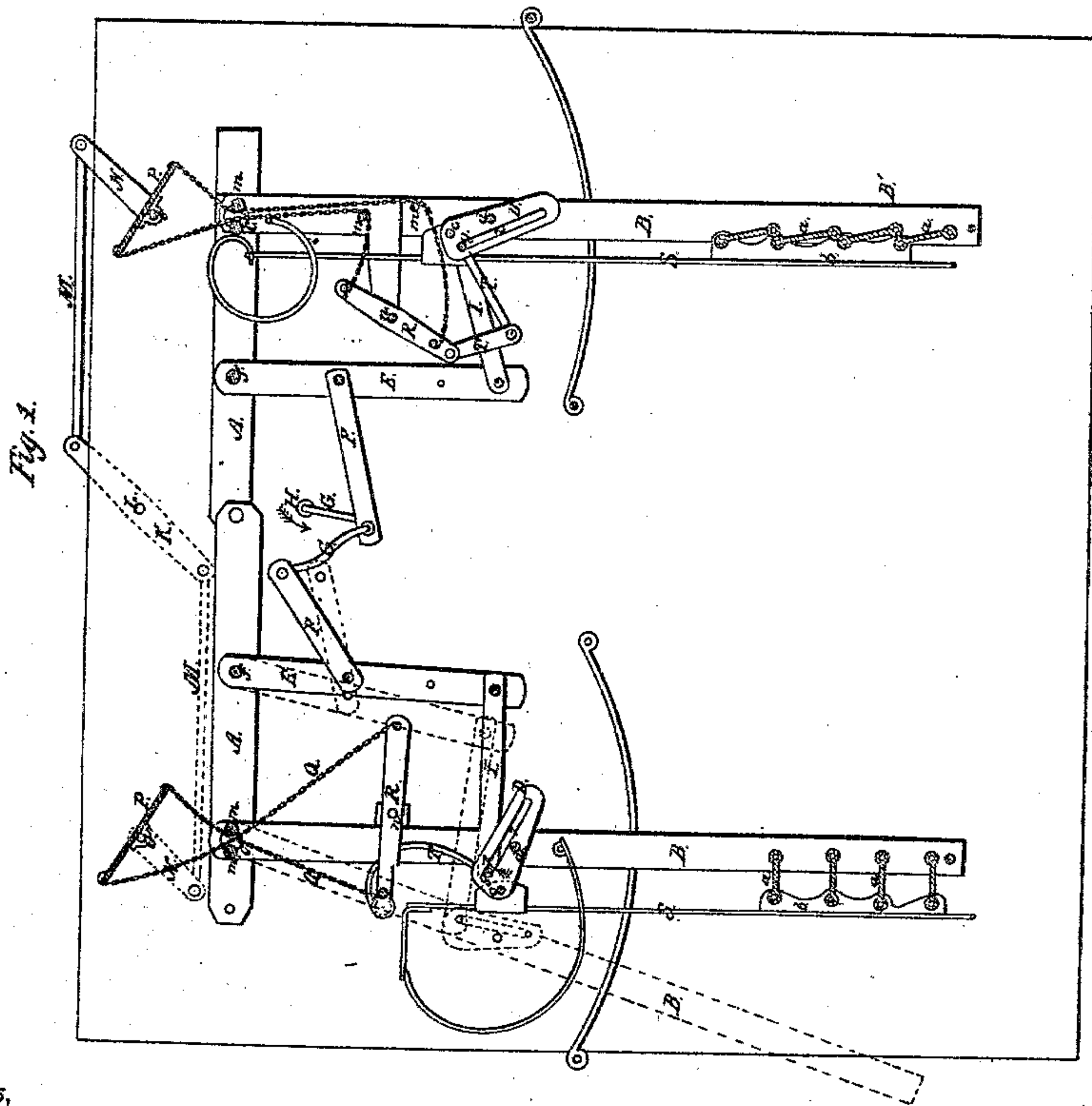
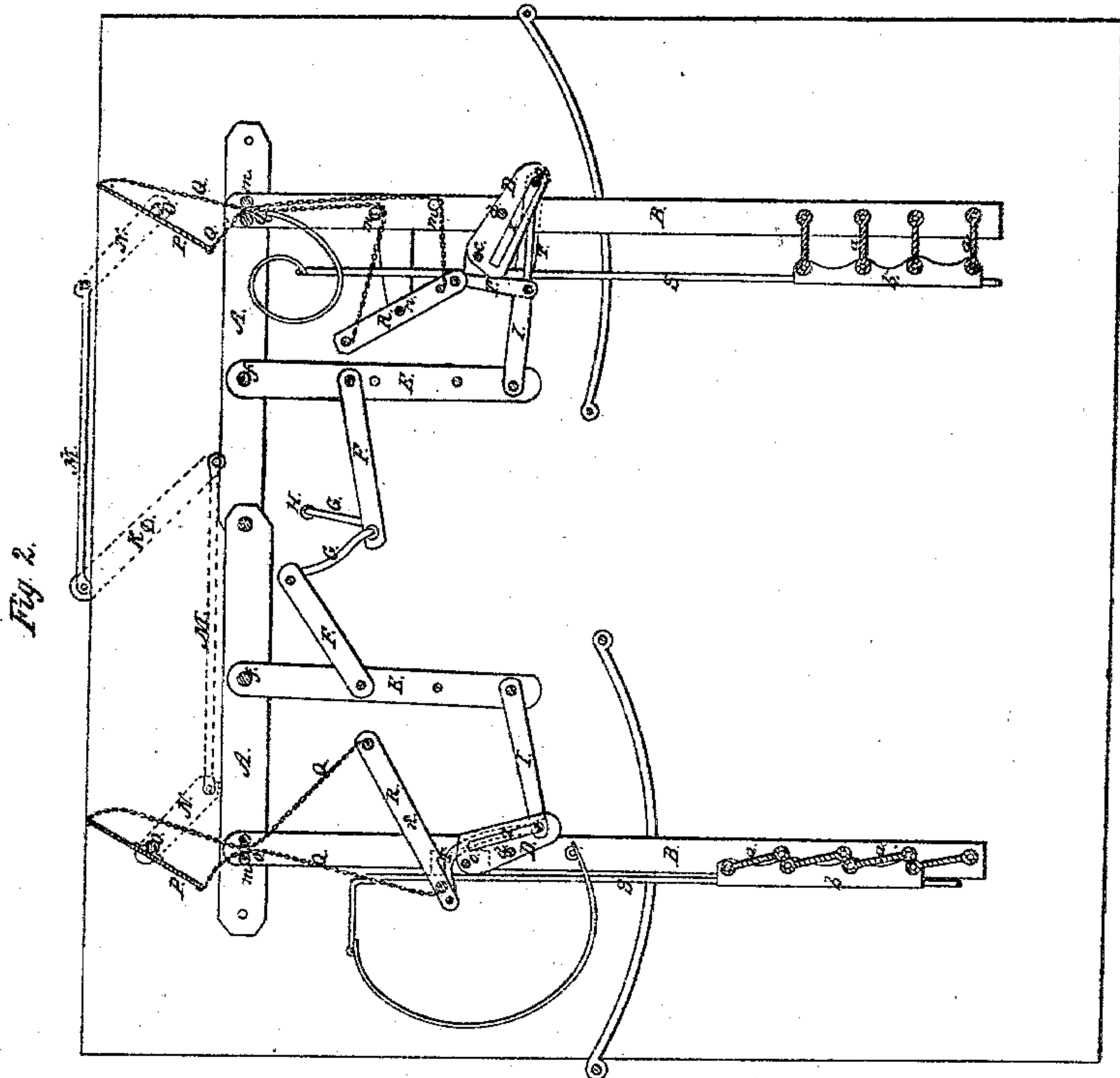


*A. F. W. Neymaber.*  
*Vibrating Propeller.*

*No. 36,165.*

*Patented Aug. 12, 1862.*



*Witnesses,*  
*Alfred D. Jones*  
*Julius F. Hensch*

*Inventor,*  
*A. F. W. Neymaber*  
*by his attorneys Putnam & Cohen*



# UNITED STATES PATENT OFFICE.

A. F. W. NEYNABER, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVED PENDULUM-PADDLES.

Specification forming part of Letters Patent No. 36,165, dated August 12, 1862.

*To all whom it may concern:*

Be it known that I, A. F. W. NEYNABER, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Pendulum-Paddles for Propelling Vessels; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 represents a side view of one pair of said pendulum-paddles. Fig. 2 represents a side view thereof, the position of the several parts having been changed, as will be more fully explained in the following description.

The nature of my invention consists in the combination and arrangement of certain links, levers, and chains with a pair of pendulum-paddle arms working in opposite directions, so as to operate said paddle-arms alternately and causing the paddles attached to the arms to open when the arms are moved in one direction, but to close and press against the water when they are moved in an opposite direction, thus exerting a continuous and even pressure against the water.

It also consists in certain arrangements by which the action of the paddles may be reversed without reversing the motion of the engine which drives the apparatus.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A represents a frame, to which the double pendulum-arms B are hung by means of the shafts C, on which they turn. The paddles *a* are hinged to the lower end of the pendulum-arms, and the ends of said paddles are hinged to the plates *b* of the bar S, which is pivoted at *c* to the cam-plate D, the latter being secured to the shaft *d*, which has its bearings in the arms B.

E represents two arms, which are pivoted to the frame A at *f*. These arms are connected by means of the pitmen F and crank G with the driving-shaft H, by the rotation of which they are vibrated. The links I are pivoted to the lower ends of the arms E, and their ends are hung to the shaft *g*, which can freely play within the grooves *z* of the cam-plates D. By turning the main shaft H in the direction of the arrow, Fig. 1, the arms E move toward the position indicated in red lines, and the shaft *g*, being at the end of the slot *z* of the cam-plate D, forces

the latter and the pendulum-arms B to the position indicated in red lines, the paddles *a* on said arms being open and passing through the water without finding any resistance therein. When the arms B have arrived at their extreme position, the crank-lever G commences its return motion, causing the cam-plate D to turn on its pivot *d* in the direction of the black arrow. This movement will raise the rods S, and, consequently, close the paddles, as represented in B'. When the paddles pass through the water in this position, they exert a pressure thereon by which the vessel is propelled; and to prevent them from yielding to the heavy pressure the ends of each paddle, while in this position, lean against the side plates *b* of the rods S, by which they are retained in their proper position. When the pendulum-rod B has arrived at the limit of its course, its motion is reversed by the rotating motion of the crank, and cam-plate D, turning to its first position, opens the paddles, which then pass through the water without causing any pressure thereon.

To reverse the motion of the pendulum-bars while the motion of the engine or of the main shaft remains the same, I have applied the following apparatus:

The double lever K is attached to the horizontal shaft L and the connecting-rods M are hinged to the ends of lever K and pivoted to the ends of the levers N, which turn on the shafts O. To these shafts are also secured the levers or plates P, and the chains Q, which are secured to them, pass over the rollers *m* down to the ends of the levers R, which are secured on the shafts *n*, and which can be turned on said shafts by operating the shaft L and the levers K M P N and chains Q. The end of the lever R is connected with the shaft *g* by means of the links T, and therefore, by turning the lever R from the position represented in Fig. 1 to that in Fig. 2, the cams are turned to the respective positions represented in said figures, and the paddles are closed or opened. This may be done while the pendulum-arms are in motion, and then the motion of the vessel is reversed.

Thus it will be seen that where a pair of such pendulum-paddles is applied to each side of the vessel one of the pair is constantly acting on the water, while the other passes through the water without any resistance. There is



no interruption in this action, nor is there any power lost, as in rotating water-wheels for raising paddles from the water, nor can there be any dead-water between the paddles, as they are arranged vertically; also, that the motion of the vessel can be reversed without reversing the engine, which in certain cases is of the highest importance, as in this apparatus it may be done instantaneously.

In the application of this apparatus for propelling vessels the position represented in Fig. 2 shows the apparatus for propelling the vessels forward, while Fig. 1 represents the position for moving the vessel backward.

Having thus fully described the nature of my invention, what I claim, and desire to secure by Letters Patent, is—

1. In combination with a pair of pendulum-paddles, the arrangement of the levers and links F E I, cam D, rod S, and paddles *a*, substantially in the manner and for the purposes herein described.

2. In combination with a pair of pendulum-paddles, the arrangement of the shafts, levers, and links K M N P R T, chains Q, cam D, and bars S, for the purpose of reversing the action of the paddles, when constructed and arranged substantially in the manner and for the purposes herein described.

A. F. W. NEYNABER.

Witnesses:

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PHILIPP ZASTMANN.