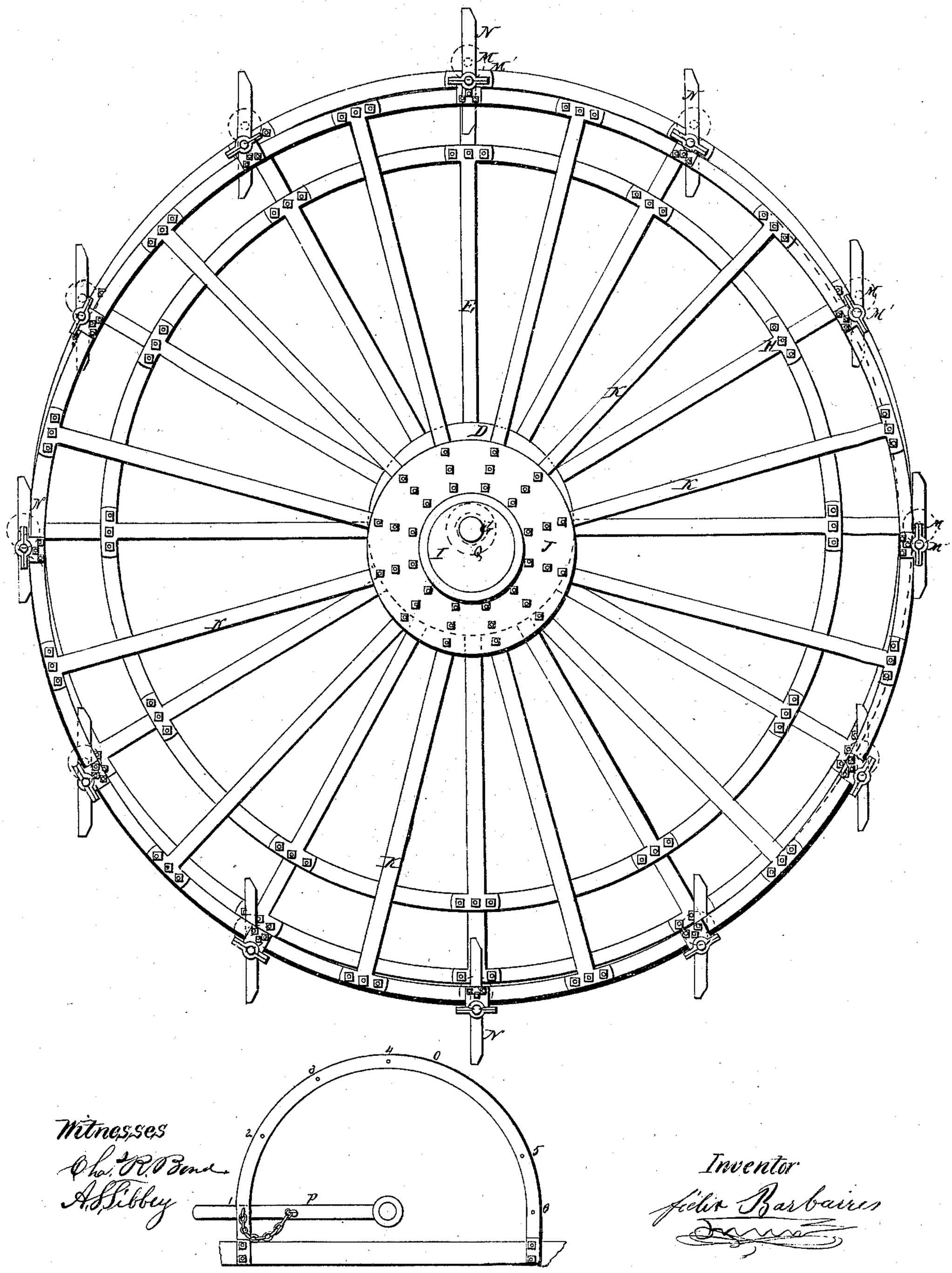
2 Sheets. Sheet 1.

F. Barbaires,
Paddle Wheel.

No. 43,173. Patented June 21, 1864.



Witnesses
Cha. R. Bond
A. S. Libbey

Inventor
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2 Sheets. Sheet 2.

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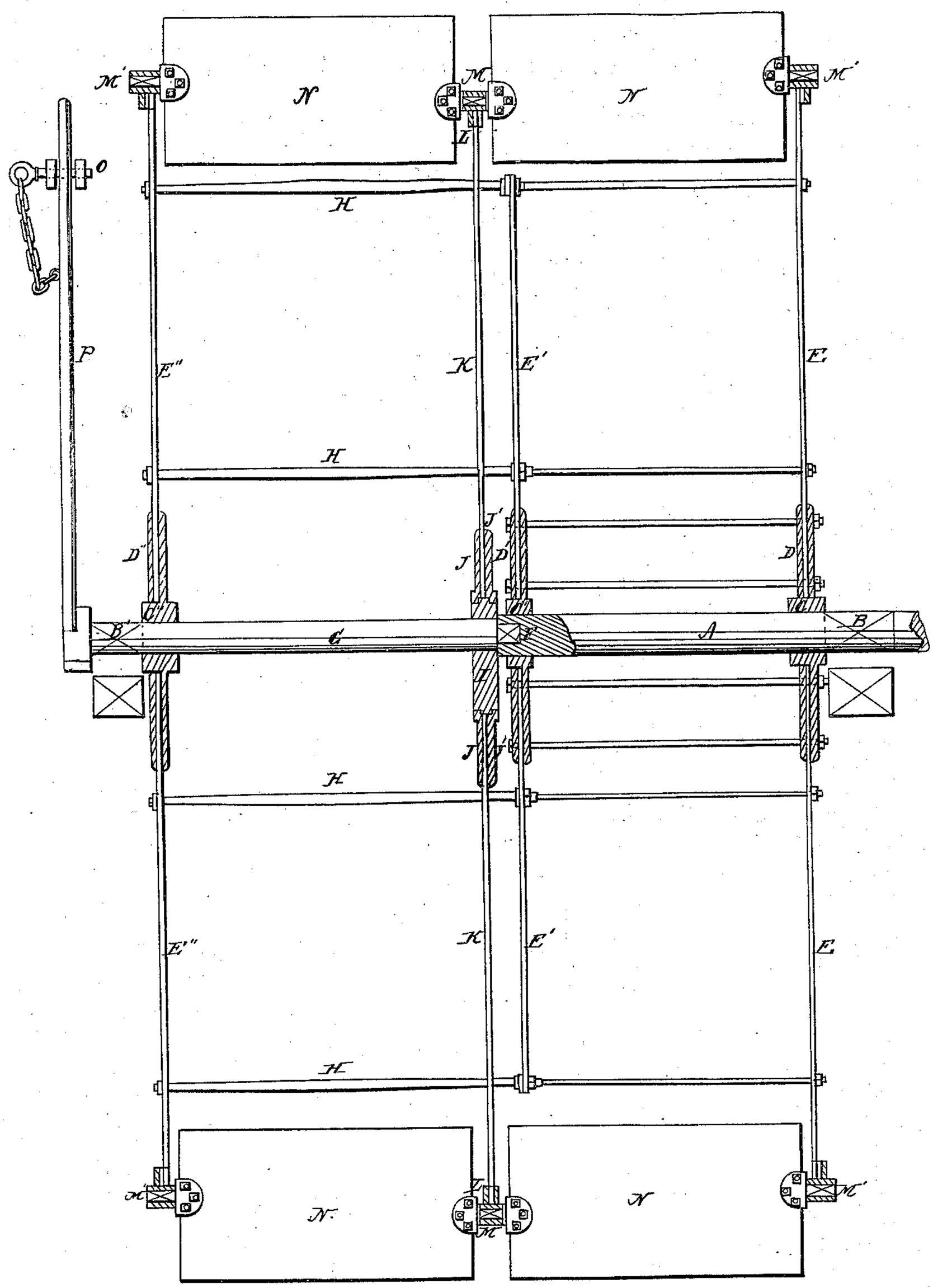

Witnesses
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UNITED STATES PATENT OFFICE.

FELIX BARBAIRES, OF SOLANO COUNTY, CALIFORNIA.

IMPROVED FEATHERING PADDLE-WHEEL.

Specification forming part of Letters Patent No. **43,173**, dated June 21, 1864.

To all whom it may concern:

Be it known that I, FELIX BARBAIRES, of Solano county, State of California, have invented a new and Improved Paddle-Wheel; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The whole wheel rests upon a portion of the main shaft A of the engine, projecting outward from the ship or vessel and supported by a pillow-block, B, which shaft receives its motion, as usual, from the engine. On this shaft are keyed flanges C C′, with their followers D D′, between which are bolted the arms E E′. The outer end of the shaft A is hollowed out so as to form a step or bearing, F, for the accessory shaft G, which rests at its outer end on the outboard pillow-block B′. The flange C″, with its follower D″, revolves loosely on the accessory shaft G. In this flange is bolted another set of arms, E″. There are cross-ties H H connecting the three sets of arms E E′ E″ together by means of nuts and collars, and stiffening the whole structure. In the center of the wheel upon the shaft G an eccentric, I, is firmly keyed, and by the projection in the center of its face is retained in its place between the two plates J J′, which are each composed of two half-circular plates that bolt together, and also fasten a set of arms, K K, that drive an outer rim, L. To this outer rim are fastened suitable bearings or boxes that take hold of the central wrists, M M, in the center of each paddle N N. Each paddle N has at each of its extremities a pivot, M′, supported by boxes attached to outer rims connected with the outer sets of arms, E E″. It will thus be seen that the position of the central wrist, M, is eccentric to that of the outer pivots, M′ M′, and the amount of this eccentricity must be equal to that of the eccentric I. On the end of the accessory shaft G is keyed a regulating arm or lever, P, the object of which is to regulate the position of the paddles, which by its means may be made to strike the water vertically, horizontally, or at any desired degree of inclination. The arm P revolves along a stationary rim, O, to which it can be fastened in any desired position by means of a pin or bolt or any other suitable device.

The operation of the apparatus is as follows: The main shaft A in its rotation carries along the arms E E′, and by means of the cross-ties H H the outer arms E″, and by the outer rims and their bearings M″ cause the motion of rotation to be communicated to the paddles N N, the outer arms E″ carrying along with themselves the follower D″ and the flange C″, which revolves loosely on the accessory shaft G. This shaft remains stationary and in any position that the regulating-arm P may have caused it to assume. The eccentric I, attached to the accessory shaft G, is therefore also stationary, but the flanges (in halves) J J′, which serve as a strap to said eccentric, participate in the motion of rotation of the main shaft A through their connection with the paddles N N, but in this rotation will move around the center Q of the eccentric I, instead of concentrically with the shaft A. As the paddles N N, by means of the regulating-lever P, can be placed in the position parallel with the line uniting the two centers of the eccentric, it follows that they will retain the same position throughout the revolution of the wheel. If the central line of the eccentric be placed vertically with the center Q of the eccentric below the center of the shaft A, the plane of the paddles will be vertical and with the greatest amount of dip that can be given to them. The regulating-lever P will then occupy the position No. 6. If the regulating-lever P be shifted to No. 1, (at a distance of half a revolution,) the paddles will still be vertical, but will have a less amount of dip, the difference in dip in these two positions being equal to the eccentricity of the wrist M. When shifted to position No. 2, the upper edge of the paddles will have a slight inclination backward, whereby they will meet with a greater resistance in passing through the water, and my experiments convince me that in this position the greatest speed will be attained with a given power. Again, by placing the regulating-lever P in position No. 4 the paddles will remain horizontal throughout the entire revolution of the wheel. This will be of great convenience in turning short bends in rivers and in avoiding other vessels or obstacles, for either wheel may be thrown in this position while the other wheel retains its full effect. The paddles of both wheels can also

be placed horizontally in this manner in case of sea-going vessels when it is desired to use sails only.

The position No. 5, which is the reverse of No. 2, and in which the upper edge of the paddles will have a slight inclination forward, may be assumed when it is desired to reverse the motion of the vessel with the greatest possible rapidity.

Having thus described my invention and its operation, what I claim, and for which I desire Letters Patent to issue, is—

1. The regulating-lever P, or its equivalent, in combination with the accessory stationary shaft G, by which the position of the paddles N N can be varied at pleasure, when constructed and operated substantially as herein described.

2. The shape of the paddle N, with wrist M, and its pivots M′, when constructed and operated substantially as herein described.

3. The eccentric I, with its strap-flanges J J′, arms K K, and their connection with the paddle-wrists M M, when constructed and operated substantially as herein described.

4. The combination and connection of the main shaft A with the accessory shaft G, regulating-lever P, eccentric I, strap-flanges J J′, outer and central arms E E′ E″ and K, and their respective connections with the paddles N N, substantially as described, and for the uses and purposes as hereinbefore set forth.

FELIX BARBAIRES.

Witnesses:

CHAS. R. BOND,

A. S. TIBBEY.