

No. 647,567.

Patented Apr. 17, 1900.

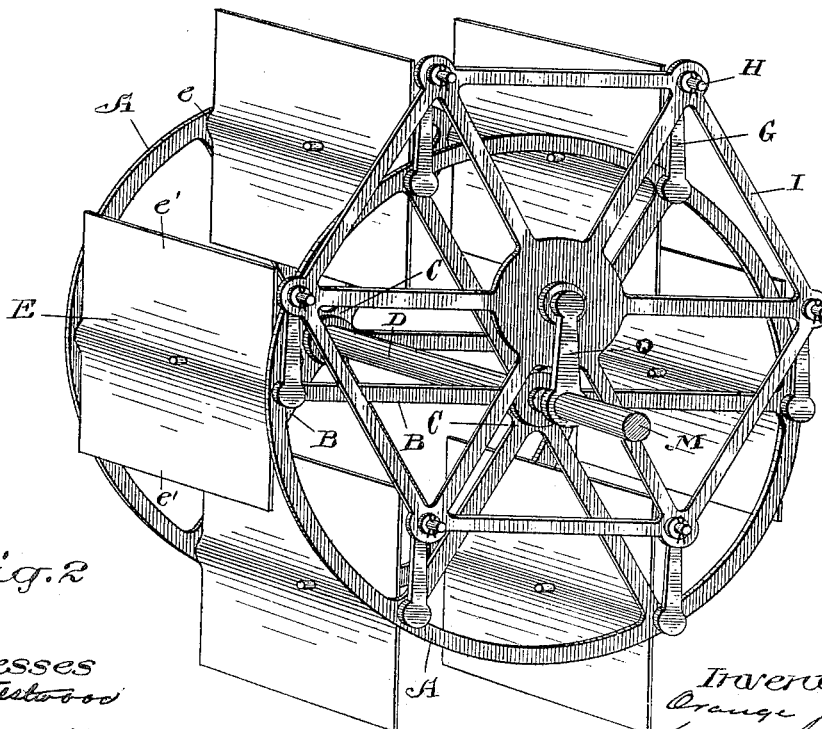
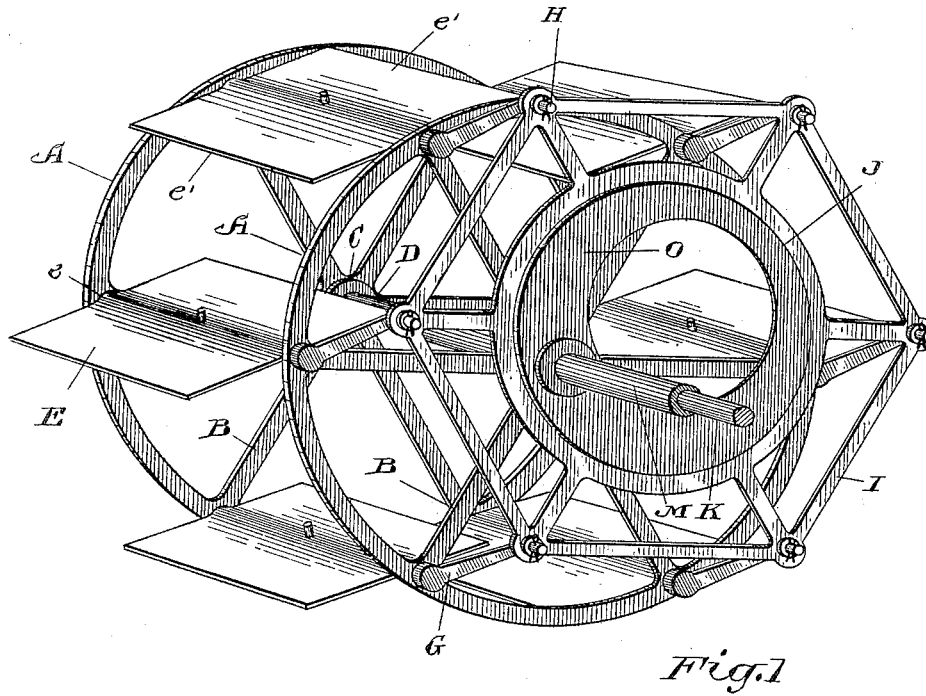
O. JULL.

FEATHERING PADDLE WHEEL.

(Application filed Jan. 27, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
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2 Sheets—Sheet 2.

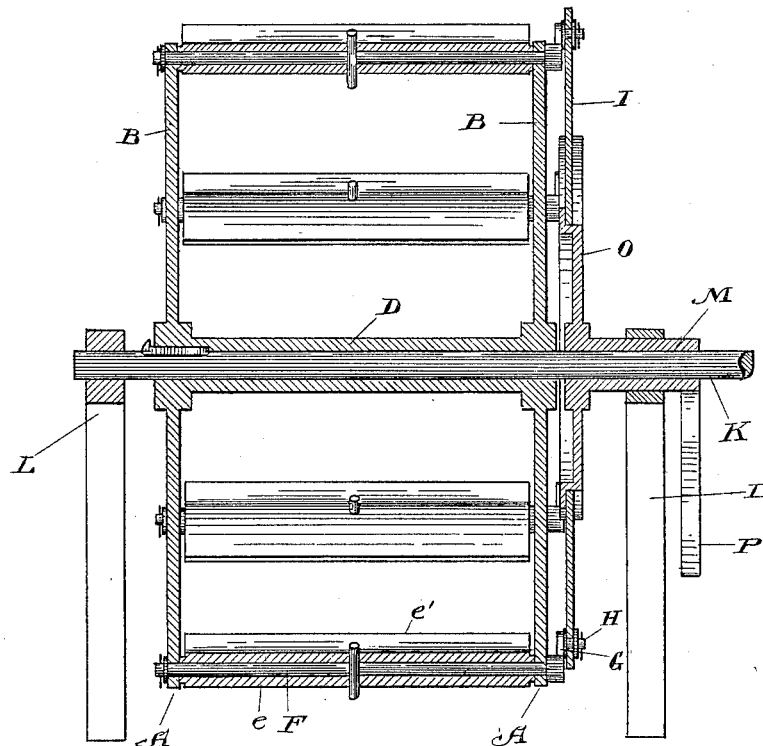


Fig. 3

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UNITED STATES PATENT OFFICE,

ORANGE JULL, OF TORONTO, CANADA.

FEATHERING PADDLE-WHEEL.

SPECIFICATION forming part of Letters Patent No. 647,567, dated April 17, 1900.

Application filed January 27, 1899. Serial No. 703,622. (No model.)

To all whom it may concern:

Be it known that I, ORANGE JULL, of the city of Toronto, in the county of York and Province of Ontario, Canada, have invented certain new and useful Improvements in Feathering Paddle-Wheels; and I hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to certain new and useful improvements in paddle-wheels, and to so construct the paddle-wheel that the buckets or paddles will enter the water without percussion or jarring and when submerged present their full area to the water to take advantage of its entire resistance and to leave the water without lifting it or raising a swell is the object of the present invention; and it consists of a paddle-wheel embracing in its construction two side frames, consisting of the usual centers, arms, and rings revoluble with the paddle-wheel, and a series of independent paddles or buckets carried by the side frames arranged to be set at any predetermined angle to the vertical axis of the paddle-wheel and revolved about their own axes during the revolution of the paddle-wheel in order that they will continuously during the revolution of the paddle-wheel maintain their same relative position to its vertical axis, as hereinafter more fully set forth, and more particularly pointed out in the claim.

In the drawings, Figure 1 is a perspective view of a paddle-wheel, showing the paddles or buckets moved into a position in which their faces are substantially at right angles to the vertical axis of the wheel. Fig. 2 is a view of a modification showing the paddles or buckets moved into a position in which their side faces are substantially parallel with the vertical axis of the wheel. Fig. 3 is a transverse sectional view through the paddle-wheel and shaft.

Like letters of reference refer to like parts throughout the specification and drawings.

A A represent the two side rings or wheels; B B, the arms; C C, the centers, and D the hub of the paddle-wheel. This much of the paddle-wheel is similar to the paddle-wheels ordinarily used.

E E represent the paddles or buckets, each of which consists of a hub *e*, substantially

equal in length to the distance between the rings A A, with sufficient clearance to allow of the free rotation of the hub, and two blades *e' e'* projecting from opposite sides of the hub *e*. Each of the hubs *e* is secured by a pin S on a shaft F, the ends of which are journaled in the rings A A. The length of the shafts F F is slightly greater than the entire width of each of the paddles or buckets E E, in order that sufficient space will be provided for the free revolution of the paddles or buckets. The same end of each of the shafts F is provided with a crank G, by means of which the shafts and paddles or buckets are rotated. Each of the cranks G is provided with a crank-pin H.

I represents a frame coupling together the crank-pins and by means of which the cranks and paddles or buckets are caused to move in unison. The relative position of all of the cranks to their respective paddles or buckets is the same in order that the paddles or buckets can all be maintained in the same relative position to the vertical axis of the shaft of the paddle-wheel. As shown in Fig. 1 of the drawings, the frame I is provided with an annular center J.

K represents the shaft of the paddle-wheel, to which the hub D is rigidly fixed. The shaft K is journaled in bearings L. Passing through one of the bearings L and surrounding the shaft K is a sleeve M, to the inner end of which is fixed an eccentric O and to the outer end of which is connected a crank P. The eccentric O is substantially of the same diameter as the center J and has its periphery formed with an L-shaped flange, producing an offset bearing-surface for the center J, which then acts as an eccentric-strap for the frame I. By means of the crank P the eccentric O can be moved into any predetermined relative position to the vertical axis of the shaft K and carry with it the frame I to alter the relative angle of the paddles or buckets to the vertical axis of the shaft. The paddle-wheel revolves with the shaft K and during its revolution carries with it the frame I. The revolution of the frame I about the eccentric O turns the paddles or buckets E E about their respective shafts and continuously maintains them at the same relative angle to the vertical axis of the shaft K. In other words,

if the paddles or buckets E E are set perpendicular the revolution of the paddle-wheel will cause the frame I to continuously turn the paddles or buckets E E about their shafts
 5 and maintain them continuously in a perpendicular position during the revolution of the paddle-wheel, so that the paddles or buckets can enter the water in a perpendicular position and pass through and leave the water in
 10 the same position in order that the entire resistance of the water may be taken advantage of to propel the boat and also to prevent the paddle-wheel lifting the water or raising a swell during its revolution.

15 Instead of using the eccentric and annular center, as shown in Fig. 1 of the drawings, it is possible to provide the sleeve M with a crank Q and connect it to the frame I by means of a pin for the purpose of shifting the
 20 position of the frame to vary the inclination of the paddles to the vertical axis of the shaft.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

25 A paddle-wheel embracing in its construction

two circular side wheels having radial spokes connecting with a central hub, a shaft on which the hub is keyed, a journal-bearing in which one end of the shaft is mounted, a sleeve loosely mounted on the other end of
 30 the shaft, a journal-bearing in which the sleeve is mounted, a crank-handle on the outer end of the sleeve, an eccentric ring on the inner end of the sleeve, an inwardly-projecting L-shaped flange on the periphery of
 35 the eccentric ring forming an offset bearing-surface thereon, a series of revoluble paddles journaled in the side wheels, a crank connected to each paddle on the outside of one of the side wheels, a frame in which the free
 40 ends of the cranks are journaled, and a central ring connected to the frame and journaled on the L-shaped flange, substantially as described.

Toronto, Canada, January 17, A. D. 1899. 45

ORANGE JULI.

In presence of—

M. A. WESTWOOD,

C. H. RICHES.