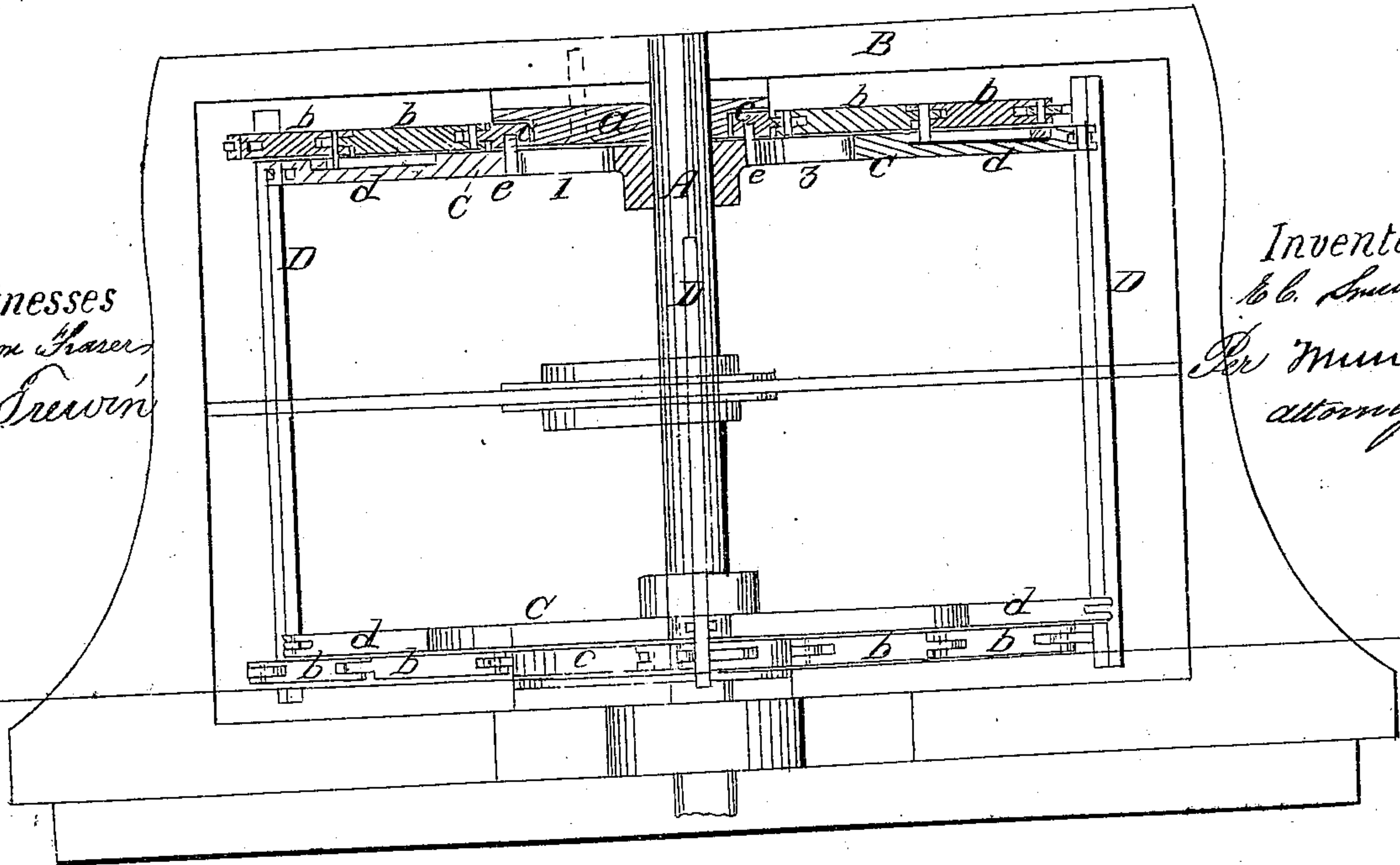
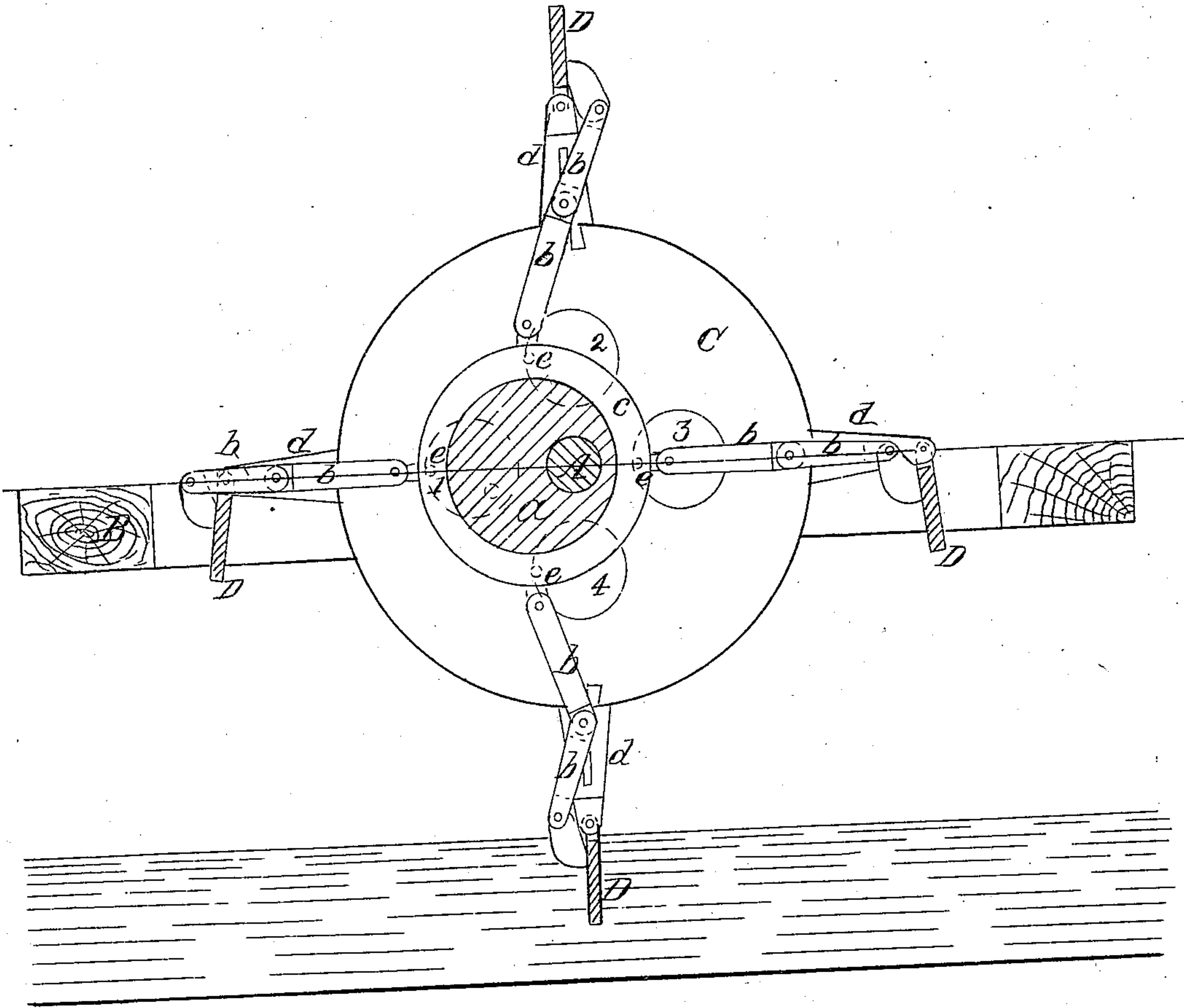


E. C. Smith.
Paddle Wheel.

Patented. Nov. 5. 1867.

No. 70637.



Witnesses
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E. C. SMITH, OF OLD RIPLEY, ILLINOIS, ASSIGNOR TO HIMSELF AND
A. G. SOMMERFELDT, OF SAME PLACE.

Letters Patent No. 70,637, dated November 5, 1867.

IMPROVED PADDLE-WHEEL.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that I, E. C. SMITH, of Old Ripley, in the county of Bond, and State of Illinois, have invented a new and useful Improvement in Steamboat Paddle-Wheel; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

Figure 1 is a side sectional view of my improved extension paddle water-wheel.

Figure 2 is a top view of the same, partly in section, through the line *x x*, fig. 1.

Similar letters of reference indicate corresponding parts.

This invention relates to an improvement in the construction of paddle-wheels for propelling steamboats, and consists in attaching fixed eccentrics upon the frame, having loose revolving collars around them, which are connected with the paddles by jointed arms, in such a manner that upon each revolution of the wheel the paddles dip perpendicularly as they descend into and rise in the water, and thus present a constant resistance at right angles to the line of the horizon. This action of the paddles of a steamboat-wheel is not novel, but the device of my invention by which it is effected is simpler and more effective than any known mechanical arrangement.

A represents the shaft of a steamboat-wheel, hung in an overhanging frame, B, as usual. The shaft passes loosely through eccentrics *a a*, that are bolted fast on the sides of the frame B, with the line of their greatest eccentricity horizontal, as shown in fig. 1. By the side of the eccentrics *a a* are fastened the disks C C, or their equivalents, which support the paddles and framework of the wheel, on the shaft A. On the eccentrics *a a* are placed loose bands or collars *c c*, which are connected with the paddles D D by jointed arms *b b*, and the paddles are also connected by a joint or hinge with rigid arms *d d* on the disks C C. Four friction-rollers, or pins, *e e*, are set in the side of the collars *c c*, to project through four circular holes or wings, 1, 2, 3, 4, made in the disks C C, equidistant from each other and from the centre of the shaft A, and having diameters equal to twice the degree or amount of eccentricity of the eccentrics *a a*. The pins *e e* bear against the sides of the circular holes 1, 2, 3, 4, and turn around in them when the shaft revolves with the disks C C, and thus move the collars *c c* backward and forward, while they travel around, a distance from the centre of motion of the wheel corresponding with the degree of eccentricity of the eccentrics, by which movement of the collars the jointed arms *b b* attached to them act on the paddles D D, to move them in such a manner that they dip into the water and rise in it vertically, or nearly so, and always exert resistance at right angles to the horizon, whereby they require less power for propelling a boat equal distances than the ordinary rigid paddles, which waste power, in descending and ascending, by their downward and upward resistance against the water.

In the construction of wheels too large for the power of two eccentrics to work the paddles, the number may be increased by attaching them to plate-iron beams which may be introduced into the wheel, as shown in red in fig. 2.

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

The fixed eccentrics *a a*, in combination with the collars *c c*, the disks C C, or their equivalents, provided with the circular holes or rings 1, 2, 3, 4, the pins *e e* on the collars *c c*, the jointed arms *b b*, the paddles D D, and the shaft A, the whole constructed, arranged, and operating substantially as and for the purpose herein described.

E. C. SMITH.

Witnesses:

F. G. SANDS,

JOHN BOYER.