

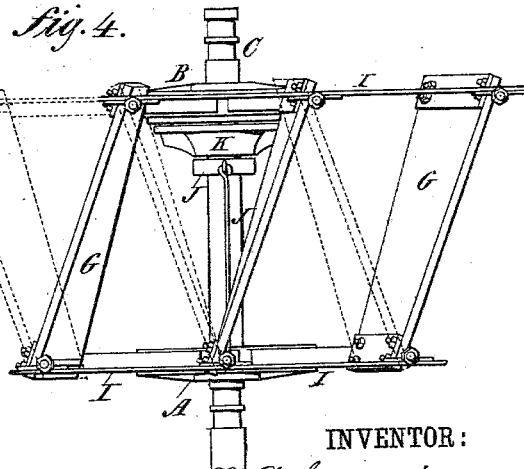
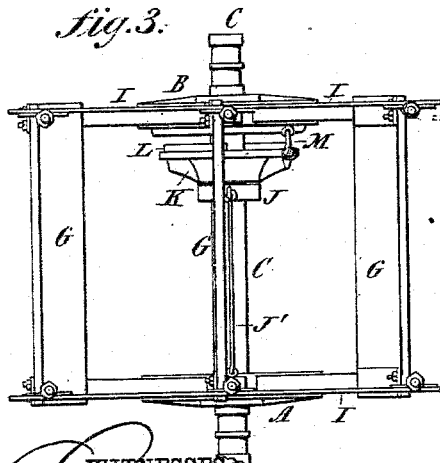
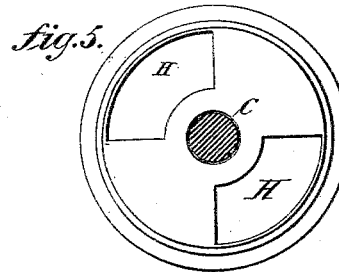
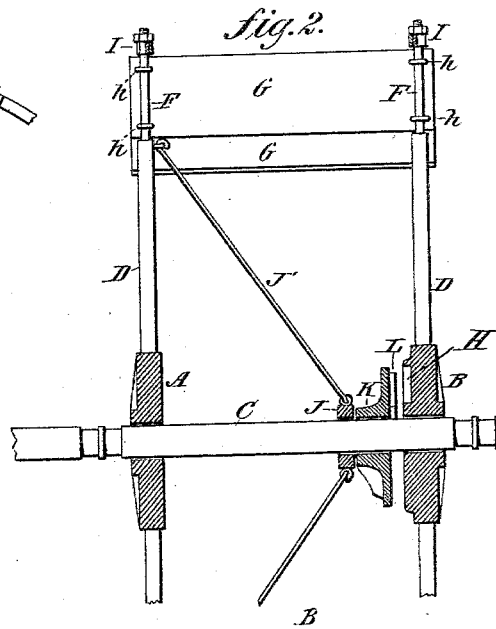
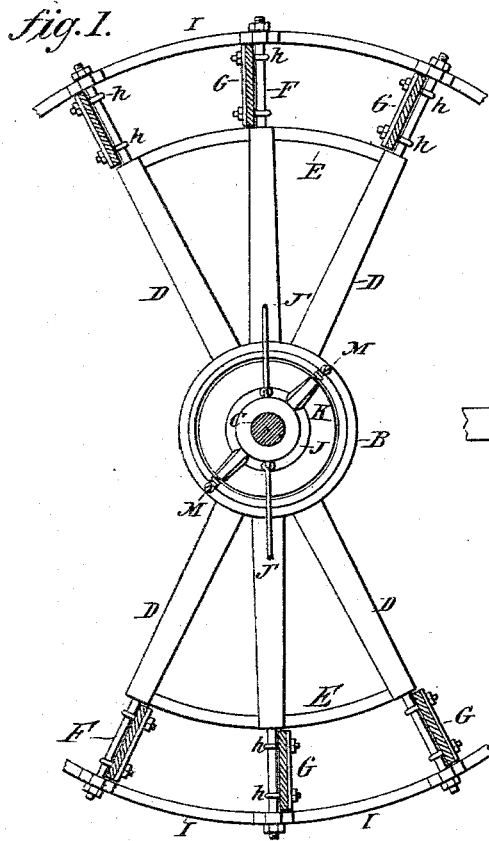
(No Model.)

A. S. MORRISON.

PADDLE WHEEL.

No. 301,746.

Patented July 8, 1884.



WITNESSES:
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UNITED STATES PATENT OFFICE.

ANDREW S. MORRISON, OF PORTLAND, OREGON.

PADDLE-WHEEL.

SPECIFICATION forming part of Letters Patent No. 301,746, dated July 8, 1884.

Application filed April 23, 1884. (No model.)

To all whom it may concern:

Be it known that I, ANDREW S. MORRISON, of Portland, in the county of Multnomah and State of Oregon, have invented a new and Improved Paddle-Wheel, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved paddle-wheel which adjusts itself automatically according to the current.

The invention consists in a paddle-wheel having the ends of its paddles secured on two circular frames, of which the inner one—that is, the one farthest from the end of its shaft—is rigidly mounted on the shaft, and the outer one—that is, the one nearest the end of the shaft—is loosely mounted on the shaft, so that when the pressure of the water is greater on the outer ends of the paddles than at the inner ends the said paddles will be inclined automatically.

The invention further consists in the combination, with the above-described wheel and the shaft, of means for preventing the paddles from being inclined too far.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a cross-sectional elevation of my improved paddle-wheel, parts being broken out. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a plan view showing the buckets parallel with the shaft. Fig. 4 is a plan view showing them inclined. Fig. 5 is a face view of the flange or collar on the shaft.

The wheel is provided with two hubs, A and B, of which the former is rigidly mounted on the shaft C, and the latter loosely. To the hubs radial arms D are secured, which are united at their outer ends by circular bars E. From the end of each spoke or arm D a rod, F, projects, the outer ends of which rods are connected by iron bands or rods I. On the rods F the ends of the buckets or paddles G are held by staples *h*, passed around the rods, and having their ends passed through the paddles and held securely by bolts, thus permitting the ends of the paddles to turn slightly

on the rods F. The hub B is provided in its inner surface with two opposite quadrant grooves or recesses, H. A collar, J, is keyed on the shaft C, and is connected by brace-rods J' with the ends of the several spokes. The keys that hold the collar J on the shaft also hold on the shaft a hub, K, which is held a short distance from the inner surface of the hub B. The hub K is provided on the surface facing the inner side of the hub B with two diametrically-opposite quadrant projections, L, which are smaller than the quadrant-recesses H in the hub B, but are so located that they can pass into the said quadrant-recesses H. Links M are pivoted to the rim of the hub K and to the rim of the hub B at diametrically-opposite points, thus connecting the two hubs. Ordinarily the buckets or paddles G are parallel with the shaft C. If the boat turns or works against the current, the pressure on the outer ends of the paddles will be greater than on the inner ends, and the outer ends of the paddles will be moved in advance of the inner ends, and thereby will turn the entire circular frame or wheel, to which the paddles are fastened, as shown in Fig. 4, whereby the paddles are placed diagonally. The wheel adjusts itself in this manner automatically, and the outer ends of the paddles are adjusted diagonally either toward the front or the rear, according to the direction in which the boat moves. If the paddles are shifted into a diagonal position, the frame on the hub B will be moved toward the frame on the hub A, as the hub B is mounted loosely on the shaft and the hub A is fixed. If the hub B moves toward the hub A, the projections L on the hub K pass into the grooves or recesses H on the hub B, and the ends of the projections L strike against the ends of the recesses or grooves H, and thus prevent the paddles from being inclined too far—that is, they check the movement of the paddles after they have been adjusted to a certain degree.

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

1. A paddle-wheel having its peripheral blades or buckets connected at one end to a fixed hub, and at their other ends to a movable hub of a common shaft, whereby said

blades or buckets are adapted to assume an oblique position to a plane passing transversely through the wheel to permit their deflection to the action of the current at the outer edge of the wheel, substantially as set forth.

2. A paddle-wheel having the ends of its paddles or buckets secured to two circular frames, of which the inner frame is rigidly mounted on the shaft, and the outer frame loosely, and on which shaft a hub is mounted with which the hub of the outer frame engages to prevent the outer ends of the paddle from being shifted too far, substantially as herein shown and described.

3. In a paddle-wheel, the combination, with the shaft C, of the hub A, mounted rigidly on the same, the hub B, mounted loosely on the same, and provided in its inner surface with recesses, and a hub mounted rigidly on the shaft a short distance from the inner surface of the hub B, and provided with projections adapted to pass into the recesses of the hub B, spokes secured on the hubs A and B, and paddles or buckets connecting the ends of the spokes, substantially as herein shown and described.

4. In a paddle-wheel, the combination, with the shaft C, of the hub A, mounted rigidly on the same, the hub B, mounted loosely on the said shaft, and having opposite quadrant grooves or recesses H in its inner surface, the hub K, mounted rigidly on the shaft a short

distance from the inner surface of the hub B, and provided with opposite projections L, which are smaller than the quadrant-recesses H in the hub B, and of spokes secured on the hubs, and paddles uniting the ends of the spokes, substantially as herein shown and described.

5. In a paddle-wheel, the combination, with the shaft C, of the hub A, mounted rigidly on the same, the hub B, mounted loosely on the said shaft, the hub K, mounted rigidly on the shaft, and provided with projections adapted to pass into recesses in the inner surface of the hub B, the collar J, rigidly mounted on the shaft adjoining the hub K, and the brace-bars J', extending from the collar J to the ends of the spokes of the opposite hubs, substantially as herein shown and described.

6. In a paddle-wheel, the combination, with the spokes, one set being connected to a loose hub, and the other set to a fixed hub of a common shaft, and having their ends united by circular bars E, of the rods F on the ends of the spokes, having their outer ends united by strips or rods I, the paddles G, and staples h, passed around the rods F, and secured on the ends of the paddles, substantially as herein shown and described.

ANDREW S. MORRISON.

Witnesses:

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