

United States Patent Office.

ELIJAH PRATT, OF NEW YORK, ASSIGNOR TO HIMSELF, DAVID MUND-
DELL, AND ALFRED MUNDELL, OF BROOKLYN, NEW YORK.

Letters Patent No. 113,561, dated April 11, 1871.

IMPROVEMENT IN PADDLE-WHEELS.

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, ELIJAH PRATT, of New York, in the county of New York and State of New York, have invented some new and useful Improvements in the Paddle-Wheels of Steamboats; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing making part of this specification—

Figure 1 being a side elevation of a steamboat paddle-wheel constructed with my improvements;

Figure 2, a vertical section of the same in a plane indicated by the line xz , fig. 1;

Figure 3, a view of one of the grooved cam-plates, by which the movements of the paddles are produced;

Figures 4 and 5, views, respectively, of the switches or pivoted switch-blocks, by which the passage from one cam-groove to another is controlled.

Like letters designate corresponding parts in all of the figures.

The object of my invention is to produce a more complete and effective movement of the paddles or floats of the paddle-wheels of that kind in which the paddles are drawn nearer to the center of the wheel in rising from the water, and are again moved outward before descending into the water; and

The nature of my invention consists—

First, in the device by which the outward and inward movements of the paddles are effected, the same when the paddle-wheels are moving backward as when turning forward; and

Second, in the device by which the outward and inward movements of the paddles are effected, by cams near the shaft of the wheel, and as small in extent as desired.

Let A represent the wheel-house around the wheel, and

B, the paddle-wheel of a steamboat.

The frame-work of the wheel may be made as usual, except that the radial arms $c c$ thereof have longitudinal slots formed therein, in which the paddles or floats D D may slide inward and outward to the extent desired; or any equivalent guide arrangement for the paddles may be adopted.

And since the paddles do not contribute to the strength of the frame-work of the wheel, cross-bars E E may extend across the wheel and connect the ends of the radial arms, being, preferably, made thin and sharp-edged, so as to go through the water with the least resistance. They also serve to protect the paddles from obstructions, and from clogging with seaweeds, &c.

In order to avoid the necessity of employing cams or guides of the full diameter of the sweep of the

paddles, and to bring them within practicable limits, each paddle is connected, by suitable connecting rods, with a rod or roller, F, nearer the shaft of the wheel.

These rods F F extend across the width of the wheel and through separate slots of the radial arms thereof, and into the grooves of cam-plates G G, which are respectively secured to the opposite inner surfaces of the wheel-house.

The inner slots of the wheel-arms are of sufficient length to allow as much outward and inward motion of the rods F F as is to be given to the paddles.

The ends of the rods F F have friction-rollers $f f$ thereon to run in the cam-grooves with as little friction as possible; and similar friction-rollers or sleeves may surround the rods where they play in the slots of the wheel-arms.

The cam-plates G G are constructed with two pairs of cam-grooves, H H and J J, the outer grooves H H being such as to hold the rods F F, and consequently the paddles D D, to their outermost limit; and the inner grooves J J such as to hold the same to their innermost limits.

The rods F F descend in the outer grooves H H, respectively, whether the wheel is turning forward or backward, thereby causing the paddles to dip as far as required into the water when descending; and the rods ascend in the inner grooves J J, respectively, whichever way the wheel turns, so as to draw the paddles toward the center of the wheel in ascending to avoid the back-lift and resistance of the water as the paddles rise out of the same, and to diminish the resistant leverage of their weight in rising as well as to increase the leverage of their weight in descending.

In order to change the passage of the rods F F from the outer to the inner grooves of the cam-plate in ascending, and from the inner to the outer grooves before descending, there is a connecting-passage or passages between the outer and inner grooves, both at the bottom and top; and there are two swinging switch-blocks, K K, so located in the bottom passages as to swing and cause the rods to ascend into the inner grooves whether moving in one direction or the other, and to swing over and cover the passage on the other side and prevent the descent of the rods again into the outer groove.

Another swinging switch-block, L, is located in the upper connecting-passage, so as to direct the rods from the inner to the outer grooves, in either direction of their movement.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The guide-cam plates G G, provided with the outer cam-grooves H H and inner cam-grooves J J,

and with connecting-passages controlled by the switch-blocks K K L or their equivalents, substantially as and for the purpose herein specified.

2. The guide-rods F F, moving in inner slots of the wheel-arms, in combination with the cam-plates G G and paddles D D, substantially as and for the purpose herein specified.

3. The combination of the sliding-paddles D D,

cam guide-rods F F, double-slotted wheel-arms c c, and cam-plates G G, constructed and arranged substantially as and for the purpose herein specified.

ELIJAH PRATT.

Witnesses:

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