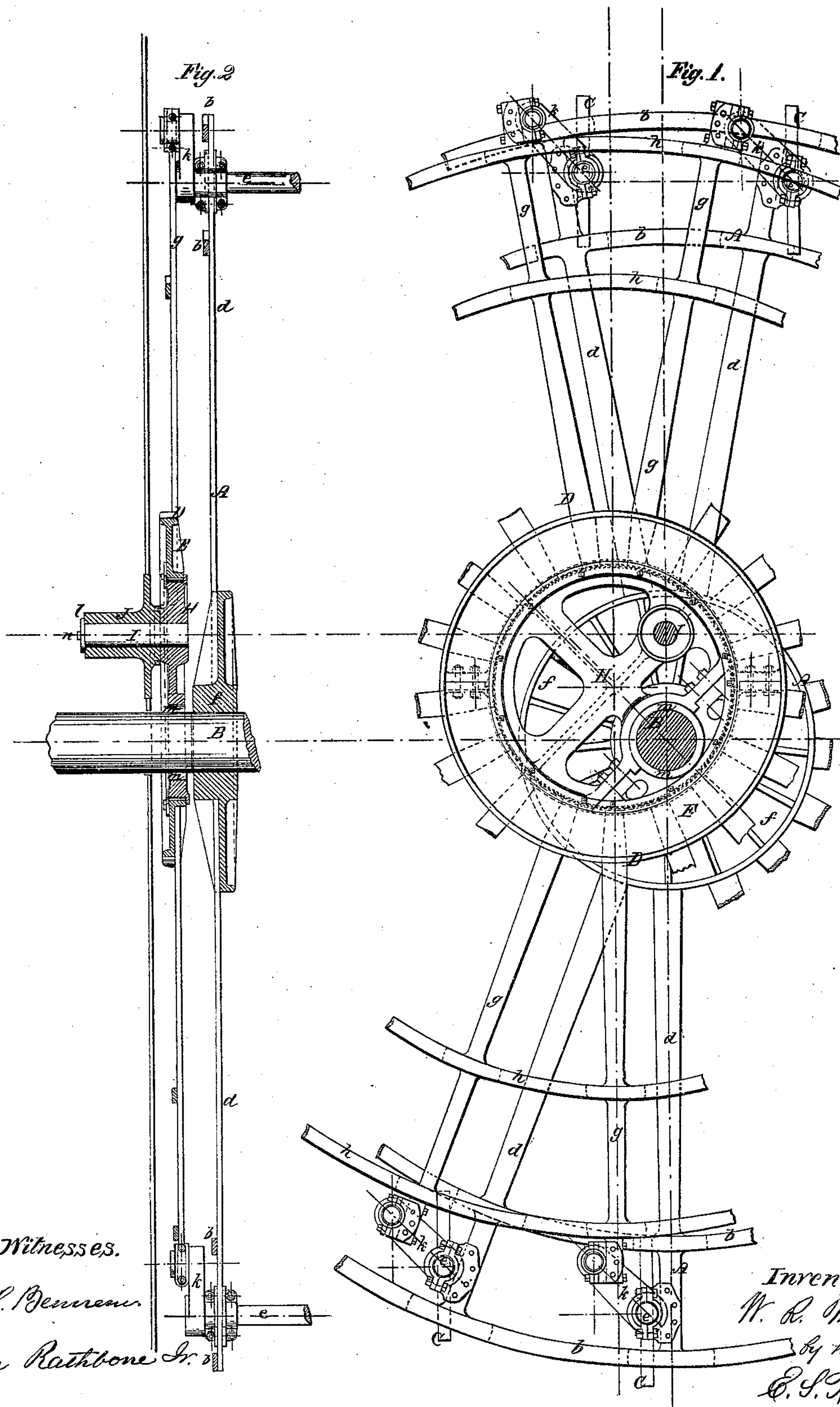


# W. R. Manley. Paddle Wheel.

N<sup>o</sup> 87,861.

Patented Mar 16, 1869.



Witnesses.

W. L. Penner.

John Rathbone Jr.

Inventor.

W. R. Manley

by his attorney

E. S. Rumick.



# United States Patent Office.

WILLIAM R. MANLEY, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND WILLIAM H. WEBB, OF SAME PLACE.

Letters Patent No. 87,861, dated March 16, 1869.

## IMPROVEMENT IN FEATHERING 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, WILLIAM R. MANLEY, of the city, county, and State of New York, have invented certain new and useful Improvements in Feathering Paddle-Wheels for steamships; and that the following is a full, clear, and exact description of my said invention.

My invention relates to that class of feathering paddle-wheels in which a rigid controlling-frame or revolving frame, with a fixed series of arms, is used to control the positions of the paddles; and the object of the invention is to enable the ordinary radial paddle-wheels to be converted into efficient feathering paddle-wheels of the said class, with the least possible expenditure. To this end,

My invention consists of the combination of the movable paddles or paddle-boards of the wheel, with a rigid controlling-frame, and with an eccentric, which is perforated with an opening, in which the paddle-wheel shaft is free to revolve, and which is connected with the side of the ship by means of a flexible connection, so that the said eccentric can play upon said connection, to permit the controlling-frame to accommodate itself to the movement of the paddle-wheel and its shaft, by strains or otherwise, and that the paddle-wheel shaft can move radially in the eccentric, so that binding or friction between the eccentric and paddle-wheel shaft is impossible.

In order that this invention may be fully understood, I have represented, in the accompanying drawing, a sufficient portion of a paddle-wheel, embodying it, to illustrate the invention, and I will proceed to describe the same.

Figure 1 represents a view of portions of the inner sides of said feathering paddle-wheel and its controlling-frame; and

Figure 2 represents a vertical section of the same, with some of the parts in elevation.

The frame A, of the paddle-wheel, is constructed, in the usual manner, of a series of rings, *b b*, and arms *d d*, the last of which are secured at their inner ends to hubs *f*, that are mounted upon and secured to the paddle-wheel shaft B.

The paddles, or paddle-boards C, are constructed to rock, being secured to rock-shafts *e*, whose journals turn in bearings supported by the arms *d* of the frame.

The controlling-frame D, which determines the positions of the paddles, is composed of series of arms *g*, secured rigidly to each other by rings *h*, and secured at their inner ends to a ring-hub E, so that the frame is rigid, and the arms do not oscillate independently upon pivots at their inner ends. This rigid controlling-frame is arranged at the inner side of the paddle-wheel, and its ring-hub E is constructed to turn upon an eccentric, H, that is constructed, as hereinafter described, with the side of the ship, so that it cannot revolve with the controlling-frame.

The eccentric H surrounds the paddle-wheel shaft B, which passes through an opening, *m*, in the eccentric, sufficiently large to permit the shaft to turn freely, the opening being so much larger than the shaft, that

there is a free space all round between the periphery of the shaft and the interior of the said opening.

The mode in which the eccentric is connected with the side of the ship is by an arm I, which is made fast to the eccentric, and is received into the socket of a socket-plate, J, that is secured to the side of the ship.

The arm I is free to move in said socket, but is prevented from working endwise out of it by a plate, *l*, and bolt *n*, at the inner end of the arm.

The controlling-frame is connected with the paddles by cranks *k*, which project from the rock-shafts *e*.

In the combination of parts thus described, the controlling-frame, being rigid, cannot descend, except the ends of its arms move in curved lines, (represented by the dotted lines *s s*, of which the axes of journals of the paddle-boards are the centres,) and, therefore, laterally, to a vertical line drawn through the axis of the supporting-arm I. Consequently, so long as the supporting-arm I holds the eccentric H sufficiently to prevent such lateral movement, it will hold the controlling-frame from deviating materially from its proper place, even if there be play at the arm between the eccentric and the socket-plate secured to the side of the ship. Hence there may be movement at said arm, to permit the eccentric and the controlling-frame to accommodate themselves to the movement of the paddle-wheel and its shaft under strains; and the arm constructed to move in the socket-plate, constitutes a flexible connection between the eccentric and the side of the ship, for that purpose.

This combination affords a convenient and efficient means of converting an ordinary radial paddle-wheel into an efficient feathering paddle-wheel, because the shaft and frame of the paddle-wheel and the outboard pillow-block of the shaft, need not be altered, and because there is a sufficient flexibility in the combination to permit the controlling-frame to accommodate itself to variations in the position of the shaft and paddle-boards, without creating undue friction, and without materially affecting the proper feathering-action of the paddle-boards.

In constructing the wheel upon this plan, I prefer to connect the eccentric directly with the side of the ship, but it may be applied to the outer side of the paddle-wheel, and connected indirectly with the side of the ship, through the guard of the wheel.

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

The relative arrangement and combination of the movable paddles of the feathering paddle-wheel, the rigid controlling-frame, the eccentric, constructed with an opening, in which the paddle-wheel shaft revolves, and the flexible connection between said eccentric and the side of the ship, the whole being constructed to operate substantially as hereinbefore set forth.

In testimony whereof, I have hereto set my hand, this 3d day of September, A. D. 1868.

W. R. MANLEY.

Witnesses:

W. L. BENNEM,

JOHN RATHBONE, Jr.