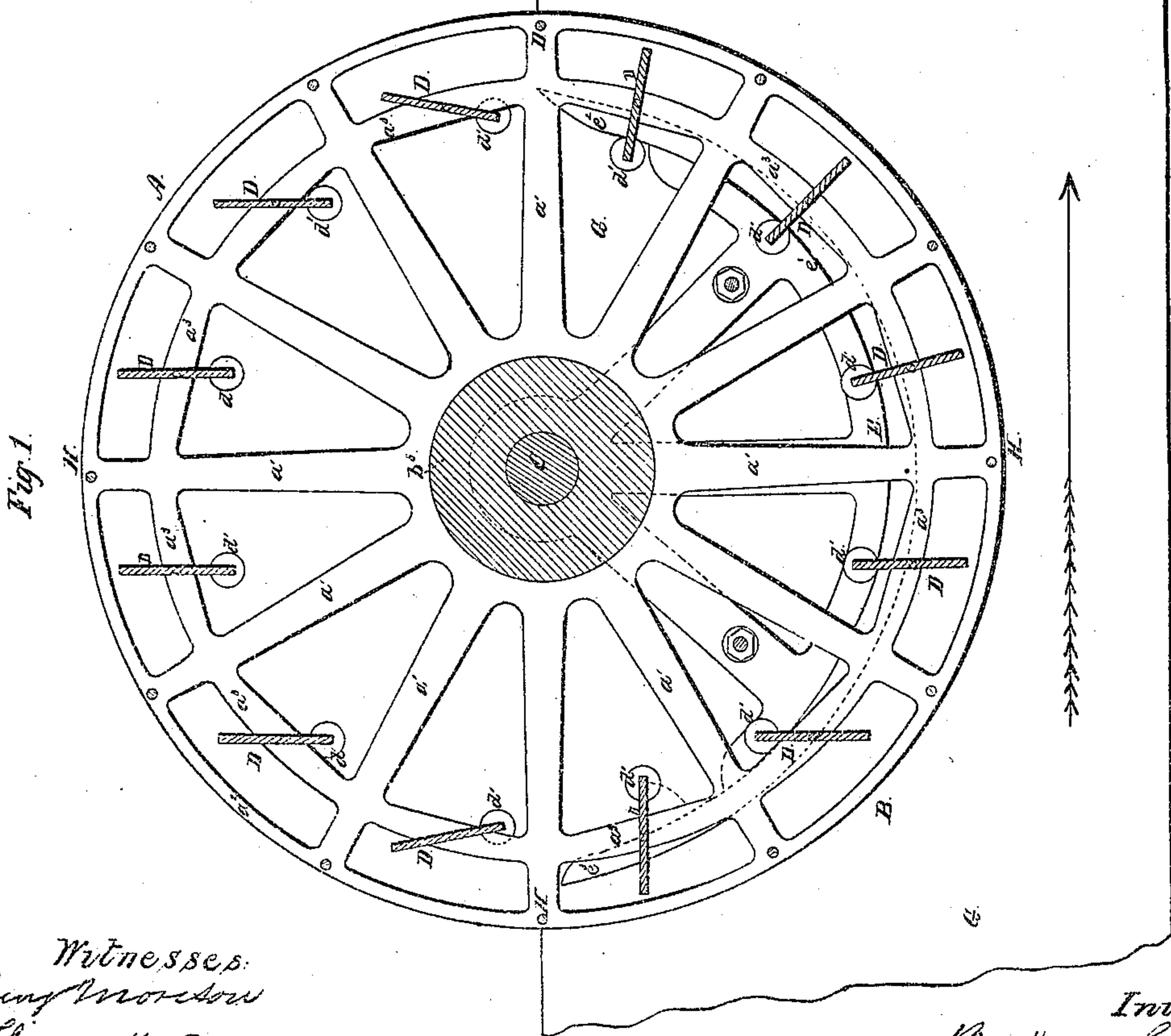
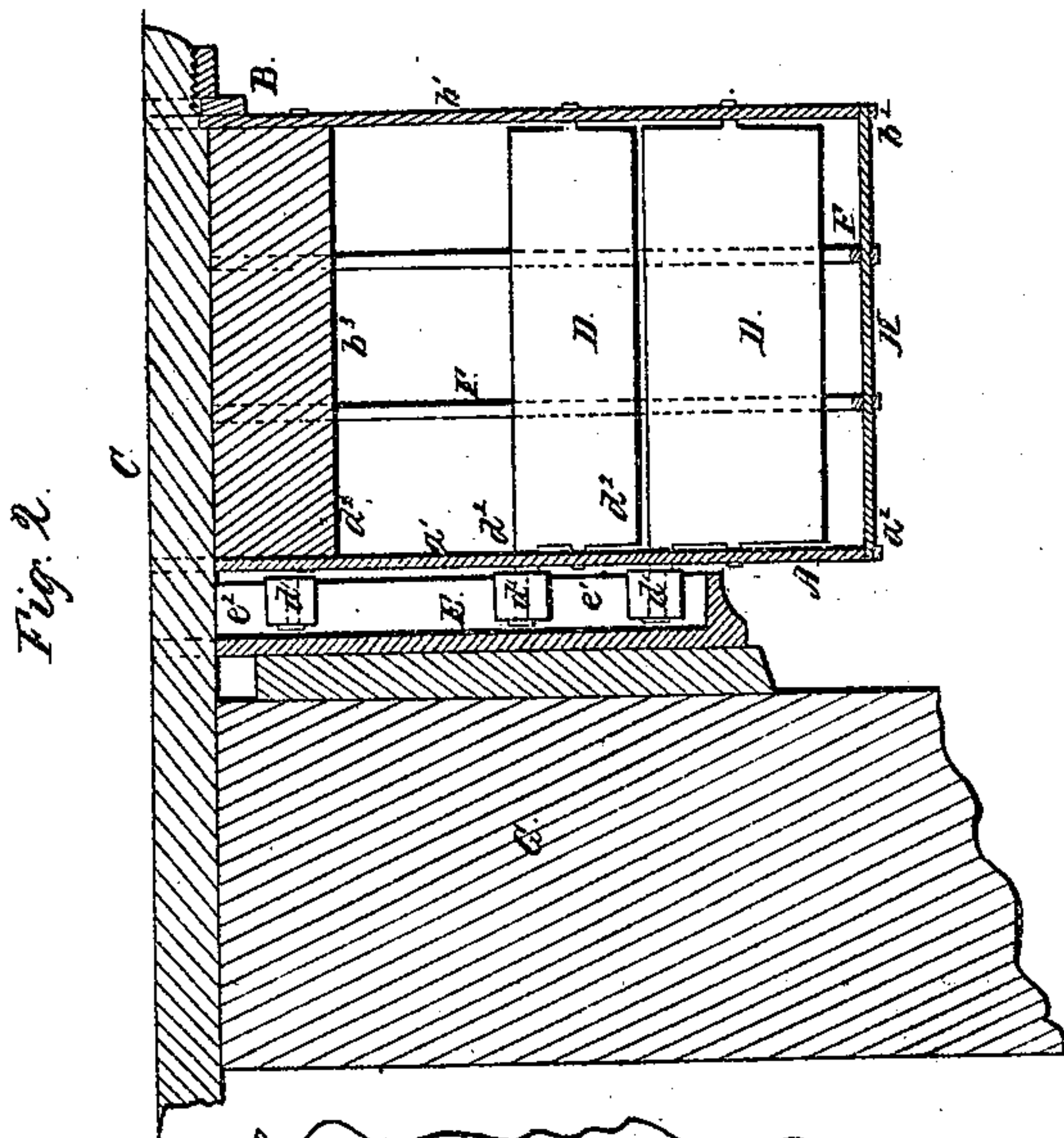


B. G. Martin.
Paddle Wheel.

N^o 48,771.

Patented Jul. 11, 1865.



Witnesses:
Benj. Morrison
Thomas M. Burr

Inventor:
Benjamin Green Martin

UNITED STATES PATENT OFFICE.

BENJN. G. MARTIN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF, THOS. M. DAVIS, L. H. WALTON, AND WATSON SANFORD.

PADDLE-WHEEL.

Specification forming part of Letters Patent No. 48,771, dated July 11, 1865.

To all whom it may concern:

Be it known that I, BENJAMIN G. MARTIN, of the city of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Feathering Paddle-Wheels; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation of the inner half, and Fig. 2 a vertical transverse section of the lower half, of the said improved wheel, like letters of reference indicating the same parts when in both figures.

My invention relates to that class of feathering paddle-wheels the paddles of which turn or oscillate on horizontal journals placed in line with the middle of the width of said paddles or floats, and it consists, substantially as herein-after described and specified, of a smooth-faced friction roller or slide on a journal projecting longitudinally from the upper inner edge or corner of the paddle, and of an irregularly-curved smooth-faced bearing suspended from the shaft of the wheel and fixed rigidly to the side of the vessel, the said parts being so arranged that during the forwarding rotary motion of the wheel the face of the said roller or slide will come into contact with the face of the bearing just previously to the time the paddle reaches the water, turn the said paddle into a position radial to the center of the wheel, and keep it in that radial or nearly radial position (by means of the said roller or slide moving on the first portion of the said smooth curved face of the bearing) until the said paddle reaches a position directly under the shaft of the wheel, and then roll or slide on the second or eccentrically-curved portion of the face of the said bearing, and thus the roller and bearing, acting together, permit the paddle to continue to keep its vertical position in the water until it leaves it and the curved bearings, when it passes freely round in an inverted swinging position on the wheel until it again encounters the curved bearing.

In the drawings, A B is the wheel, C the shaft, D D the paddles or floats and d' d' their friction-rollers, and E the curved bearing.

The frame of the wheel A B and its paddles

D D are intended to be made of iron, and the former in the well-known skeleton or open form of construction, there being in this case two series of radial arms, $a' a'$ and $b' b'$, each series being fixed upon the shaft C at a proper distance apart for the reception of the paddles D D between them, and having each a peripheral rim, $a^2 b^2$, connected together by the cross-bars F F, and having also a stretcher, b^3 , of wood, around the shaft C, which serves as an abutment against which to secure the arms properly upon the shaft. The arms of each series are also connected together by intermediate pieces, $a^3 a^3$, (see Fig. 1,) which serve as bearing-supports for the journals of the paddles D D, the respective journals of the latter working freely in the middle of the same, so as to allow the paddles to oscillate freely thereon.

At one of the inner corners of each paddle a journal, d^2 , carrying a friction-roller, d' , projects beyond the series of arms of the inner side of the wheel and the piece a^3 , while the open space between the said piece a^3 and the two arms to which it is fixed allows a limited extent of oscillation to the paddle, its friction-roller d' being confined to that side of the piece a^3 which is nearest to the center of the wheel.

The curved bearing E is suspended from the shaft C, and also bolted firmly to the boat or ship, a section of which latter is represented at G. This curved piece E presents on its outer side a curved plane or bearing-surface, e' , which is concentric to the shaft C from its forward end, e^2 , to a vertical line passing through the center of the shaft C, and from said line it is made gradually eccentric to its opposite or rear end, e^3 . It is also counter-curved at its extreme ends, and is so placed as to turn the paddles D D (as their respective rollers $d' d'$ are successively brought into contact with it during the rotatory motion of the wheel A B) upward into radial or nearly radial positions before the said rollers can enter and move upon it, and so that when the rollers have successively mounted it it will, in connection with the rollers, continue to keep the paddles D D firmly in radial or nearly radial positions while their said rollers are traversing the concentric portion of the said curved plane of bearing E; and so, also, that while the said rollers d' are traversing the eccentric portion of the said

curved plane the paddles will be permitted to freely take and preserve a vertical or nearly vertical position until they have left the water, when the weight of the rollers and their journals will cause the paddles to tilt over into a proper position for being again operated by the curved bearing E. These different positions of the paddles are clearly represented in Fig. 1.

The intermediate rims, F F, correspond in size and form with the rims a^2 b^2 , and are secured in positions equidistant from each other and the said rims a^2 and b^2 by means of the cross-bars H, as seen in Fig. 2.

Operation: In the drawings the wheel is represented as rotating, so as to propel the vessel forward in the direction of the arrow V, (see Fig. 1,) and it will therefore be readily understood that as soon as the friction-roller of either of the paddles is brought on the curved plane of the bearing E the paddle will then have been turned from its vertical to a radial position, and the roller will then move along on the bearing E, holding the paddle firmly in the radial position until the eccentric portion of the curve is entered upon by the roller, and consequently the paddle gradually allowed to take

and preserve a vertical or nearly vertical position until it leaves the water, thus effecting more perfectly the object of feathering paddle-wheels.

The construction, it will be seen, is comparatively simple, entirely effective, and not liable to get easily out of order in use. It will also be seen that the intermediate guard-rims, F F, will be very effective in preventing large pieces of ice and other large floating objects from getting into contact with the paddles—an important object to be effected.

Having thus fully described my improvement and pointed out its utility, what I claim as new therein of my invention, and desire to secure by Letters Patent, is—

The smooth-faced friction slide or roller d' on each of the floats or paddles D D, and the smooth-faced irregularly-curved bearing E on the vessel, the said parts being constructed and arranged to operate together, substantially as and for the purpose described.

BENJAMIN GREEN MARTIN.

Witnesses:

BENJ. MORISON,

THOMAS M. DAVIS.