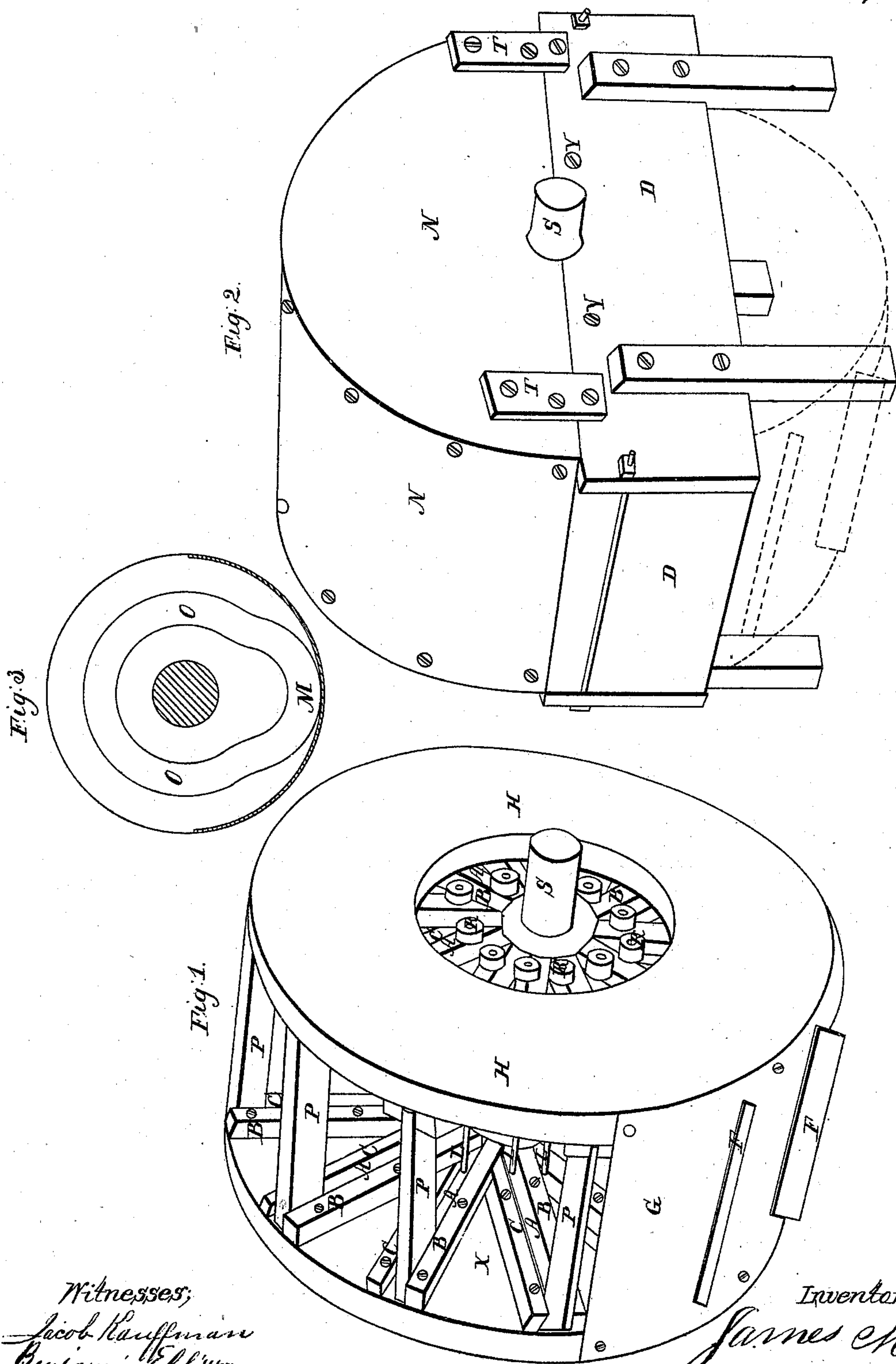


J. Merkel.
Paddle Wheel.

N^o 50,973.

Patented Aug. 7, 1866.



Witnesses;
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UNITED STATES PATENT OFFICE.

JAMES MERKEL, OF MOUNT PLEASANT, IOWA.

IMPROVED PADDLE-WHEEL.

Specification forming part of Letters Patent No. 56,973, dated August 7, 1866.

To all whom it may concern:

Be it known that I, JAMES MERKEL, of Mount Pleasant, in the county of Henry and State of Iowa, have invented a new and Improved Paddle-Wheel; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of my improved wheel, showing a portion of the outer case removed to expose the interior of the wheel. Fig. 2 is a perspective view of the wheel arranged within the wheel-house. Fig. 3 is a view of the cam for operating the paddle-boards.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in a paddle-wheel which is so constructed that the paddles will be projected beyond the circumference of a rotating cylinder as the buckets successively descend into the water, and are then drawn within said cylinder as they rise out of the water, thus preventing the lifting of the water, and a consequent loss of power, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, H H represent two circular heads, which may be made up of wood-work in any suitable manner, and secured together by means of transverse timbers and a cylindrical casing, G.

If desirable, the drum may be made of metal wholly; or it may be composed chiefly of wood strengthened by metal braces.

On the inside of each head H a series of radial arms, B C, are rigidly secured, all of which radiate from a central shaft, S, which is rigidly bolted to the inner ends of the said arms by means of flanges and screw-bolts in any suitable manner.

The radial arms B C are arranged upon the inside surfaces of the heads H H in pairs, in such relation to each other that they form parallel guides or radial grooves for receiving and guiding the paddle-boards P P, and also the arms A A, to which these boards are secured, as shown in Fig. 1.

Directly opposite the outer ends of the sev-

eral paddle-boards P P oblong slots F F are made through the cylinder G, which slots are of sufficient length and width to allow their respective paddles to be forced through them and exposed for a considerable distance beyond the circumference of the cylinder.

Near the inner ends of the paddle-arms A A transverse rods L L are used for the purpose of tying these arms together, also for the purpose of serving as bearings for anti-friction rollers R R, which are arranged on that side of the wheel which has a central opening through it, as shown in Fig. 1. When the paddles P P are all drawn within the circumference of the wheel the axes of all the anti-friction wheels R R are concentric to the axis of the wheel-shaft S.

The opening which is through the center of the circular head H (shown in Fig. 1) is of sufficient diameter to admit within it the cam-plate, (shown in Fig. 3,) which has a cam-slot, O, in that face which comes next the paddle-arms A A. This cam-plate M has a hole through its center, through which the shaft S passes loosely, and it is secured rigidly to the side of the vessel by means of bolts Y Y. (Shown in Fig. 2.)

The friction-wheels R R are all adjusted within the cam-slot O O, and they follow the curve of this slot as the wheel is turned.

It will be seen, by reference to Fig. 3, that the upper portion of the slot O is concentric to the axis of the central hole through the plate M, and that the lower portion of this slot is concentric to a point which is below said hole, the curve being of much shorter radius than the curve described from the center of the said hole. As the friction-wheels on the inner paddle-arms are all compelled to follow this cam-slot when the paddle-wheel is rotated, those paddles the rollers R R of which are in the eccentric portion of the slot O will be thrust out beyond the circumference of the wheel, and those paddles which are acted upon by the slot of greatest diameter will be drawn within the circumference of the wheel, and held in this condition until they are acted upon by the slot of smallest diameter, when they will be thrust out beyond the circumference of the wheel, and thus caused to act upon the water and propel the vessel. As the paddles successively approach the water they are sud-

denly thrust out beyond the circumference of the closed drum, and in this condition they act upon the water. As the paddles successively commence to leave the water, and before any lifting-action can take place, the paddles are drawn within the circumference of the drum. As the drum must be slotted to allow the paddles to operate as above set forth, this drum will take in water; but to prevent any serious loss of power from this cause I shall fill up the spaces within this drum in such manner that the drum will take in very little water.

In Fig. 2 I have represented the housing or paddle-wheel box of one wheel. This may be constructed in any of the well-known ways, and, if desirable, a cam-plate, similar to that shown in Fig. 3, may be applied to the outer end of this housing, so as to operate upon friction-rollers applied to the outer arms of the paddles, as described, for the inner side of the wheel.

In Fig. 1, letter X indicates a section of the filling which is between the guide-arms of the paddle-boards to exclude water from the interior of the wheel-casing.

If desirable, water-tight apartments may be

employed, instead of the solid filling shown. These will add buoyancy to the wheel, and at the same time exclude water, leaving spaces between said apartments just sufficient to allow the paddles a radial reciprocating motion.

It will be seen from the above description of my improved paddle-wheel that it will operate just as well on the rear of a vessel, as a stern propeller, as on the side of a vessel; also, that it will operate just as well when submerged in the water as when partially submerged.

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

The combination of the stationary cam-plate M, anti-friction rollers R R, and radially-reciprocating paddles with a drum, H G, having the spaces between the paddles filled, and all constructed and arranged to operate substantially as described.

JAMES MERKEL.

Attest:

JACOB KAUFFMAN,
THOMAS D. NEFF.