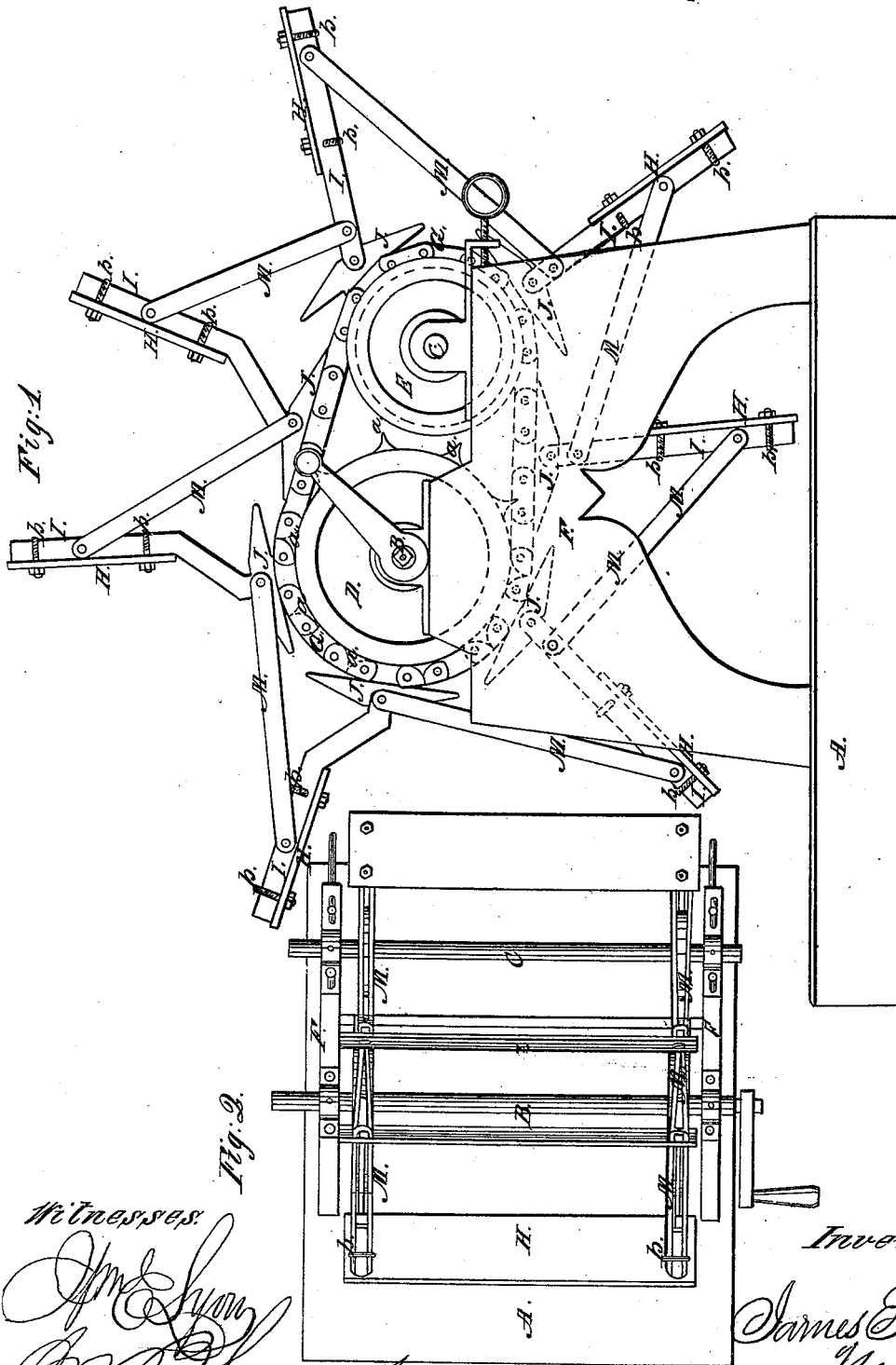


J. Granger.
Chair Propeller.

N^o 53,812.

Patented Apr. 10, 1866.



Witnesses:

Wm. L. Loring

Inventor

James E. Munroe & Co.
attys.

UNITED STATES PATENT OFFICE.

JAMES GRANGER, OF ZANESVILLE, OHIO.

IMPROVED PADDLE-WHEEL.

Specification forming part of Letters Patent No. 53,812, dated April 10, 1866.

To all whom it may concern:

Be it known that I, JAMES GRANGER, of Zanesville, in the county of Muskingum and State of Ohio, have invented new and useful Improvements in Paddle-Wheels; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The present invention relates to that class paddle-wheels in which the paddles are hung or attached at each end to endless chains passing over two wheels at each end, to which the necessary rotary movement is imparted in any proper manner; and it consists in so arranging the said wheels and hanging the paddles on and to the endless chains that a sweep in a circular direction will be given to the paddles in their passage through the water, whereby they are caused to continually press upon and against it—a result of the utmost importance to the success of chain-wheels, and which with wheels of a similar class now in use or heretofore invented has never been satisfactorily accomplished.

In the accompanying plate of drawings, Figure 1 represents an end elevation of a chain paddle-wheel made according to my improvements applied to a suitable stand for it, and Fig. 2 a plan or top view.

Similar letters of reference indicate like parts.

A in the drawings represents a stand, on which, for convenience of illustration, my improved chain paddle-wheel is hung, turning by its shafts B and C, respectively, having similar wheels or pulleys D and E at each of their ends, in uprights or standards F F at suitable distances apart therefor, the paddle-wheels being embraced in and between the said uprights. Around these pulleys D and E, at each end of their respective shafts B and C, passes an endless chain, G, to which at suitable points the paddles H H are hung, as will be presently explained, the number of which is to be more or less according to the length of the chains, and the points of hanging the paddles are to be equidistant from each other.

The paddles H H are each secured at or

near each end to the outer portion of an arm or holder, I, which holders at their inner ends are pivoted to the center of bridge-pieces J, hung in and between two of the links of the chain G, hereinbefore referred to, at the proper points, the said bridge-pieces being of sufficient length, that as the chains pass from one pulley, D, to the other, E, they will span the entire length of chain between the two bearing-points of the pulleys, and thus support the paddles and give to them a circular movement, and also support and strengthen the chains, while at the same time they can freely pass around either one or the other of the said pulleys D and E, as is plainly shown in the drawings, the distance between the two pulleys D and E at each end of the paddle-wheel being made equal and of the least possible length practicable.

The pulleys D D are the larger in diameter of the two sets D and E, and to their shaft is attached the driving power used for operating the paddle-wheels, they being placed toward the stern of the vessel on which the paddle-wheels are to be hung, consequently bringing the other or smaller pulley, E, toward the bow. The stern-wheels D D are to be made sufficiently large to allow the requisite length of chains to be used to hold the desired number of paddles, and they are also made with a series of cogs, *a a*, upon and around their peripheries, which cogs interlock and engage with the links of the chains as they pass around the wheels.

From the arms I at each end of the paddles H to the arms of the paddle next behind in each case extends a connecting-arm, M, pivoted at each end, and extending from a point at or near the bridge-pieces J of each paddle to a point at or near the outer ends of each of the said paddle-arms I, as is plainly shown in the drawings.

From the above description of the manner in which the paddles are hung upon the endless chains and the chain-wheels or pulleys arranged it will be seen that the paddles in traveling around will be caused to enter the water in an upright position, which is the most favorable position, and to move through the water with a circular sweep or direction.

The arms M, in lieu of being hung to the paddle-arms I or the paddles H, as described,

in which case they operate to pull the paddles through the water, firmly bracing and causing them to run steady, may be hung to one paddle or its arm at or near its outer end, and to the next paddle-arm behind it, at or near its hinging-point, to the endless chain, when they will operate to push the paddles through the water; but I do not deem it so desirable or practicable as that explained and shown.

The paddles H H may be hung upon their respective arms I I by clasps *b b*, if so desired, thus enabling them to be drawn out from

or moved in and toward the endless chains, as is obvious.

I claim as new and desire to secure by Letters Patent—

The combination of the paddles H, arms I I, connecting-holders M, bridge-pieces J, endless chain G, and pulleys D E, constructed and arranged in the manner and for the purpose herein specified.

Witnesses: JAMES GRANGER.

SAMUEL CHAPMAN,

JOHN QUIGLEY.