2 Sheets--Sheet 1.

C. SMITH.
Chain-Propeller.

No. 161,170. Patented March 23, 1875.

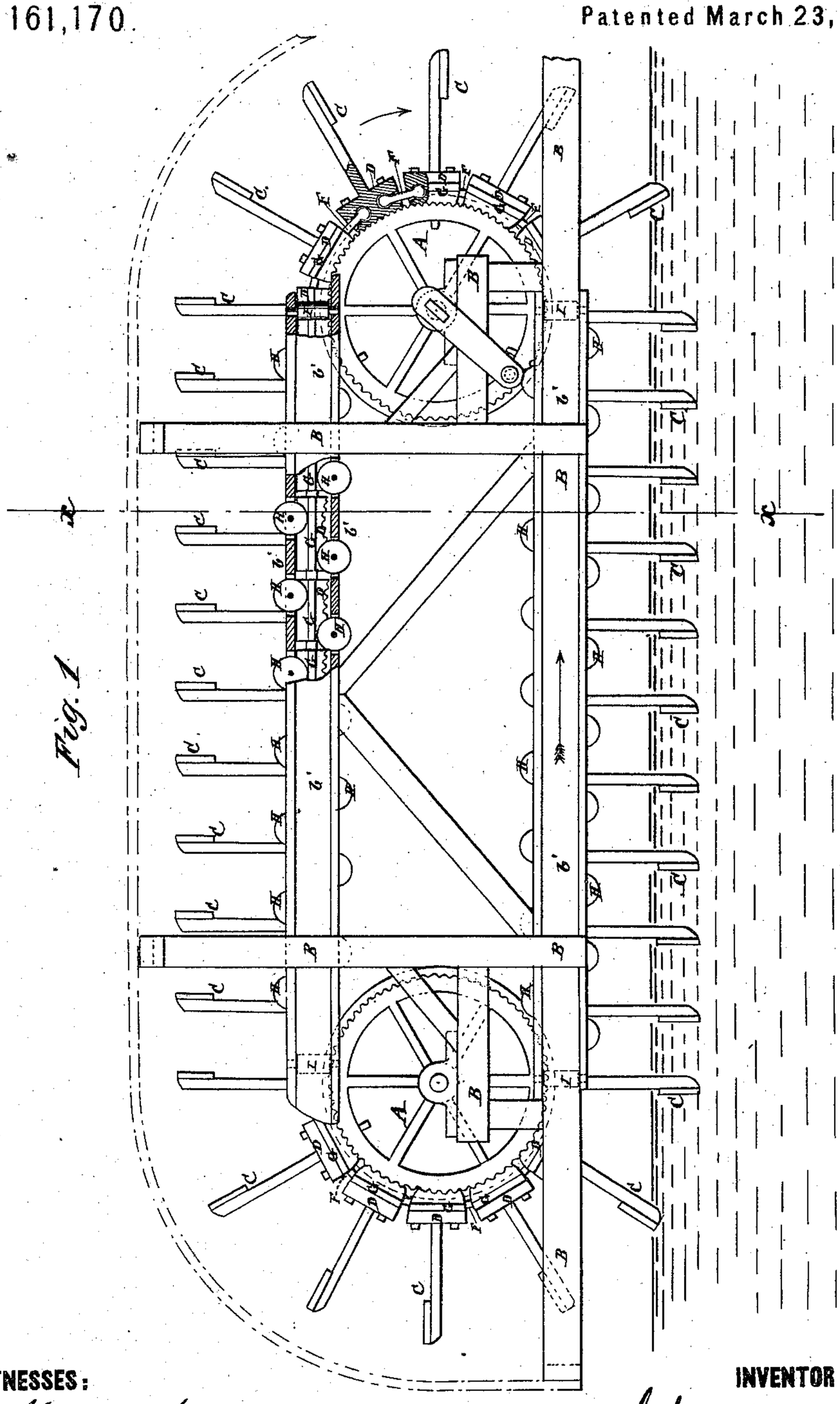

Fig. 1.

WITNESSES:

A. W. Almquist

A. F. Terry

INVENTOR:

Clark Smith

BY Munn & Co

ATTORNEYS.

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

2 Sheets--Sheet 2.

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Fig. 2

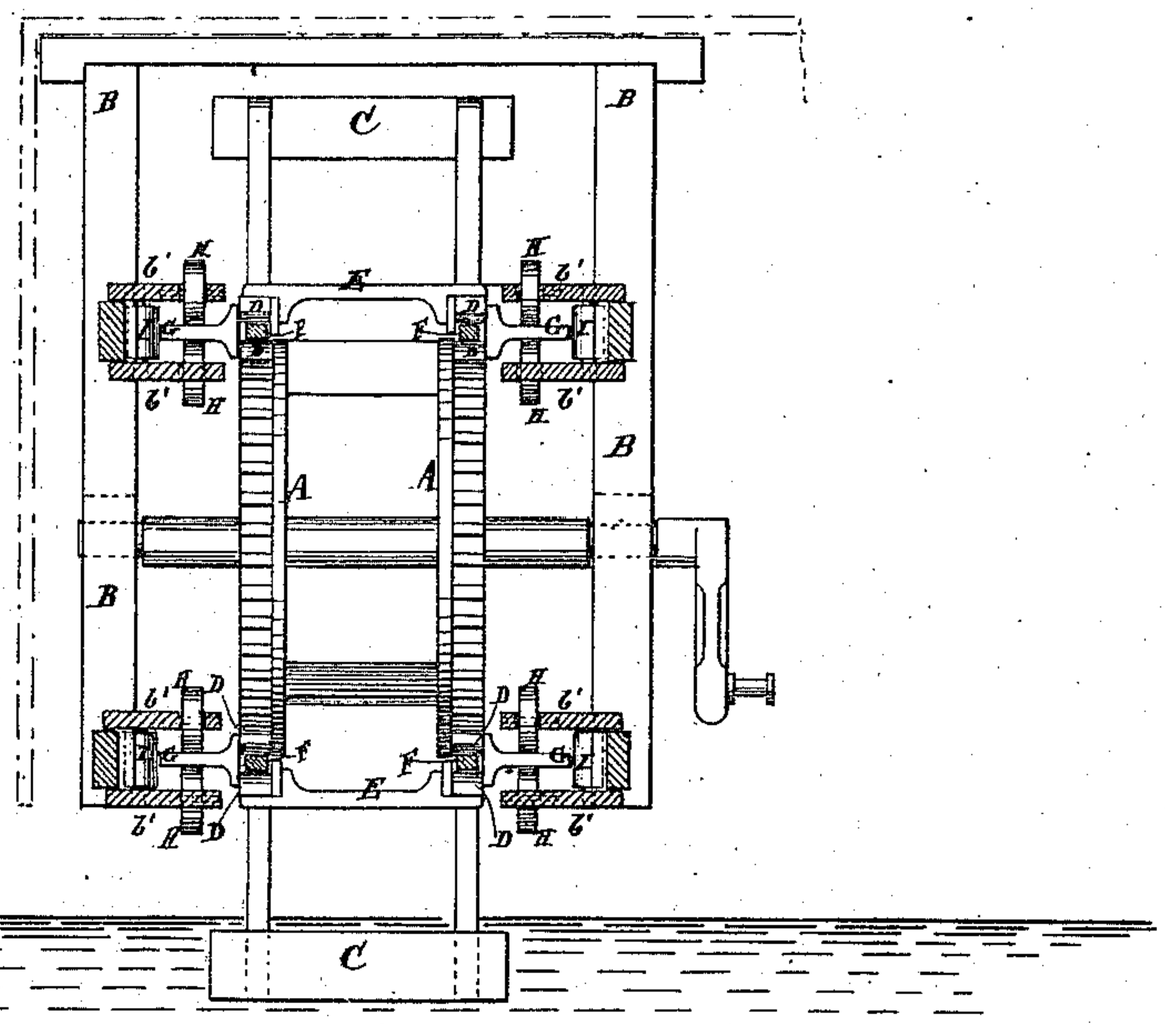
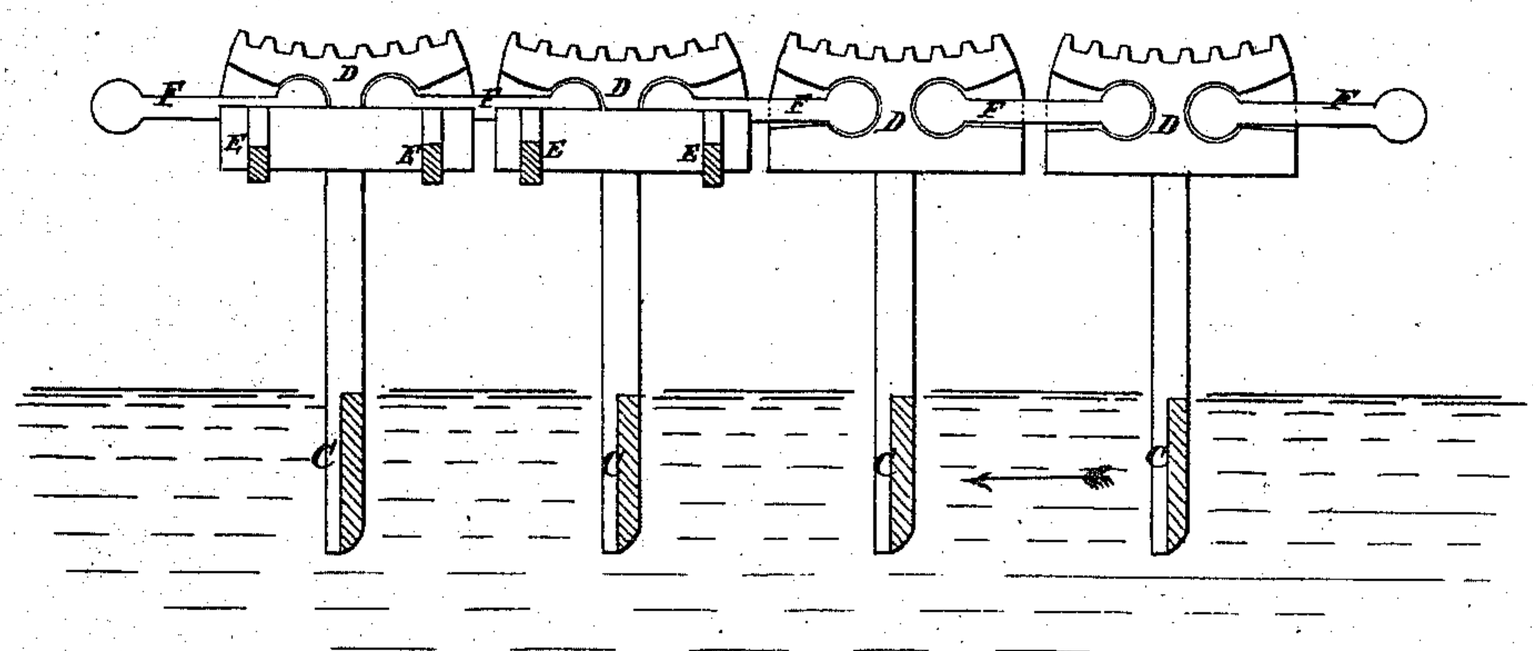


Fig. 3



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UNITED STATES PATENT OFFICE.

CLARK SMITH, OF CORNWALL ON THE HUDSON, NEW YORK, ASSIGNOR TO HIMSELF AND WILLIAM H. CLARK, OF SAME PLACE.

IMPROVEMENT IN CHAIN-PROPELLERS.

Specification forming part of Letters Patent No. **161,170**, dated March 23, 1875; application filed October 24, 1874.

To all whom it may concern:

Be it known that I, CLARK SMITH, of Cornwall on the Hudson, in the county of Orange and State of New York, have invented a new and useful Improvement in Endless-Chain Paddle-Wheel, of which the following is a specification:

Figure 1, Sheet 1, is a side view of my improved paddle-wheel, parts being broken away to show the construction. Fig. 2, Sheet 2, is a vertical cross-section of the same, taken through the line *x x*, Fig. 1. Fig. 3, Sheet 2, is a detail section of a part of the same enlarged.

Similar letters of reference indicate corresponding parts.

My invention has for its object to furnish an improved endless-chain paddle-wheel, which shall be so constructed that the paddles may move back and forth between the wheels in straight lines, and thus without any sag, and at the same time with very little friction, and which shall be simple in construction, strong, durable, and not liable to get out of order.

The invention will first be fully described, and then pointed out in the claim.

A represents the wheels around which the endless chain of paddles passes to one of which the power is applied, and the journals of which revolve in bearings attached to the frame-work B. C are the paddles, the inner ends of the arms of which are attached to blocks D, the two blocks D of each paddle C being connected and held exactly opposite to and parallel with each other by two cross-bars, E, attached to the end parts of their outer sides. Upon the inner sides of the blocks D are formed gear-teeth, which mesh into gear-teeth formed upon the rims of the wheels A, so that the paddles may be carried forward with a positive movement. The blocks D are connected together by short bars F, which have balls formed upon both ends to enter sockets in the end parts of the said blocks D, and thus form an endless chain of paddles. Upon the outer sides of the blocks D are formed flanges G, which pass along horizontal grooves or ways *b'* attached to and forming a part of the frame-work B. To the upper and lower sides of the ways *b'* are pivoted friction-pulleys H, which rest upon the upper and lower sides of the flanges G as they pass through the said ways *b'*, and thus cause the chain of paddles to pass back and forth between the wheels A without sagging, and in straight lines. The chain of paddles is kept from getting out of a straight line laterally by rollers I, pivoted in the ways *b'*, and against which the edges of the flanges G rest.

By this construction, should any of the paddles be injured or broken, they can be readily replaced by new ones. This construction also holds the paddles firmly in place, while acting upon the water, and at the same time causes them to work with a comparatively small amount of friction.

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

The combination with a series of paddle-blocks, D, jointed together, and provided with side flanges G, of upper and lower ways provided with top, bottom, and side rows of friction-rolls, as and for the purpose specified.

CLARK SMITH.

Witnesses:

MOSES CLARK,

DANIEL E. POPE.