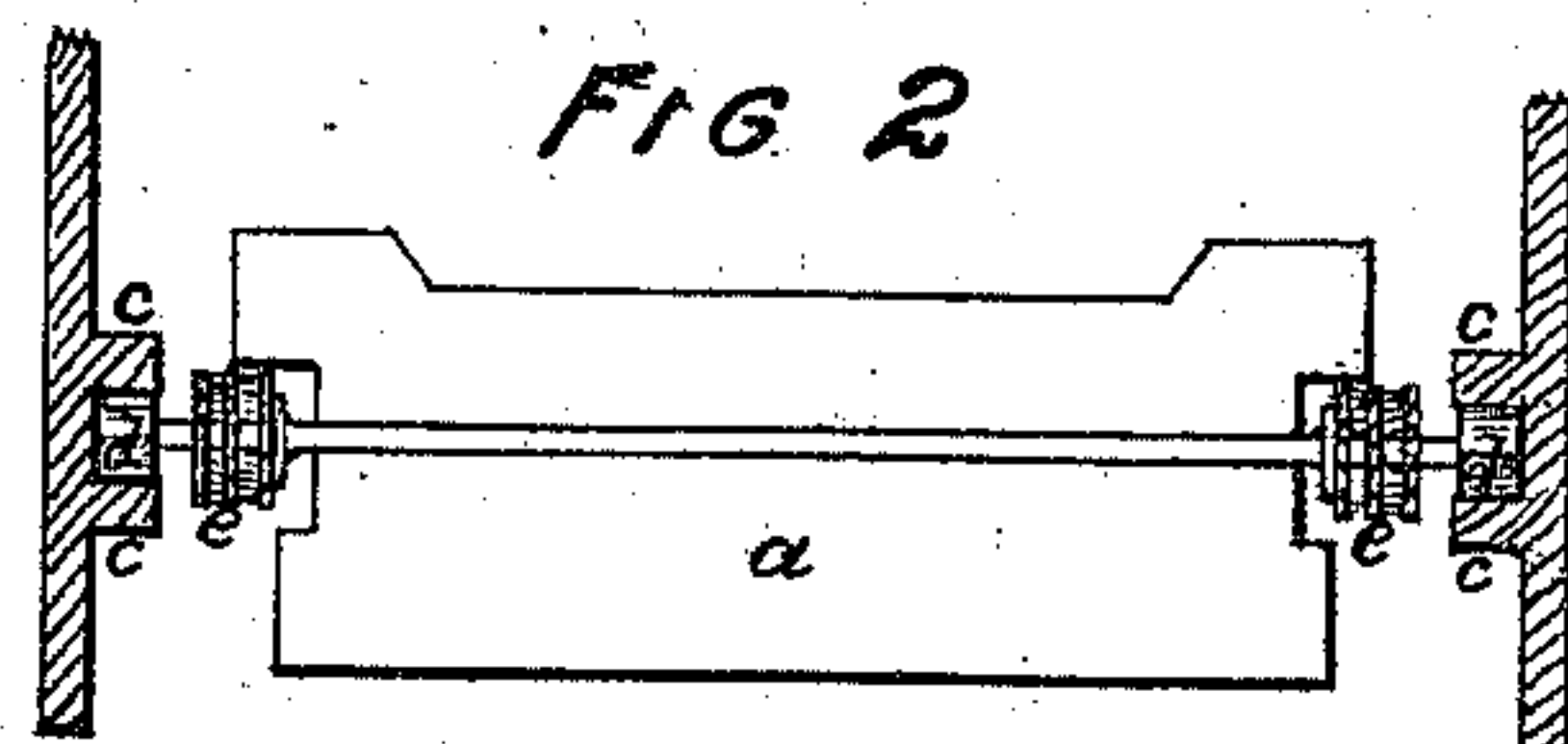
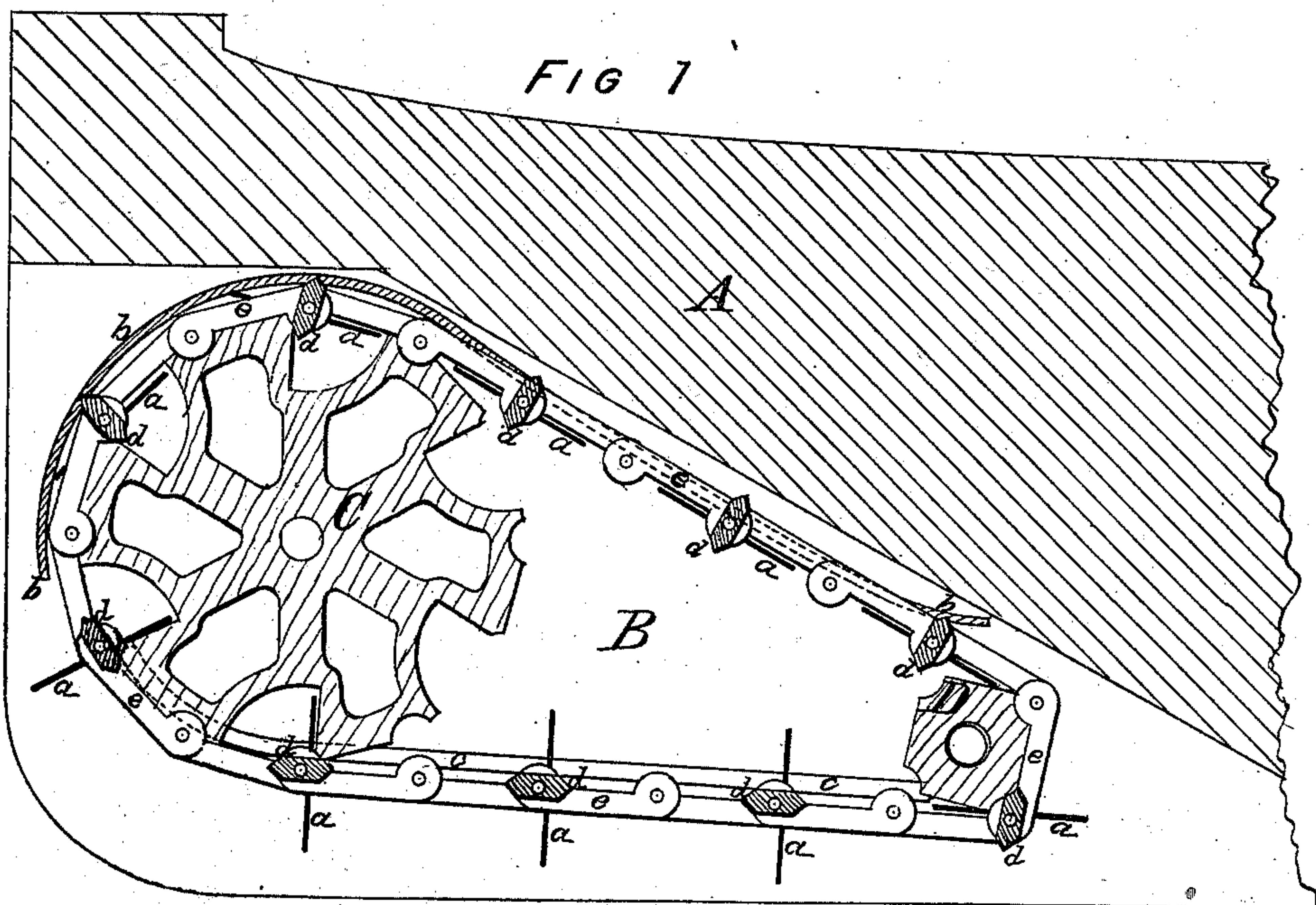


E. P. RUSSELL.
Chain-Propellers.

No. 142,653.

Patented September 9, 1873.



N B Smith } Witnesses E P Russell
Clinton Smith } Inventor

UNITED STATES PATENT OFFICE.

EDWIN P. RUSSELL, OF MANLIUS, NEW YORK.

IMPROVEMENT IN CHAIN-PROPELLERS.

Specification forming part of Letters Patent No. 142,653, dated September 9, 1873; application filed August 2, 1872.

To all whom it may concern:

Be it known that I, EDWIN P. RUSSELL, of Manlius, Onondaga county, and State of New York, have invented a new and Improved Boat-Propeller.

The nature of my invention consists in a propeller which is to be operated under and back of the bow of a boat. The buckets and machinery are so constructed and operated that they are constantly working in the headwaters caused by the motion of the boat when running at the rate of three or four miles an hour in the narrow and shallow waters of our canals. While the buckets are working the excess of water in front, back, and under the boat they are clearing a way for the boat and shoving it ahead. The buckets are so operated that they are in an upright position while running back, and in a horizontal position while running front, thereby costing half less lost power than any propeller heretofore in use; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings and to the letters of reference marked thereon, forming a part of this specification, in which—

Figure 1 shows a side view of my invention. Fig. 2 one of the paddles disconnected.

The letters used represent corresponding parts where they occur.

I place the propeller B under, inside, and back of the bow of the boat A. At each end of the forward axle are wheels C C with their periphery cut to receive the back and upper edge of the bucket, as directed by guide *b*, while at each end of the rear axle are wheels D D, adapted to the links and joints of the chain. The motive power may be attached to either of the axles. The chain is constructed of metallic links *c c c*, hinged upon bolts or upon the axle of the paddle, as required in ordinary form, and is so arranged with reference to the wheels C C and D D that the joints will knuckle into the periphery of the wheels, as shown in the drawings; or, I may use a chain with straight links, with lugs on the outer edge of the wheels C C and D D to fit the links of the chain and guide, and hold it from slipping. At every other or at a greater number of joints a hinged paddle is located, the axle of which serves both to sustain the paddles and to

make joints for the chain. The paddles are rigidly attached to the axle. The periphery of wheels C C are so cut as to allow the paddles to move freely on the journals of the axle in any position, as directed by guide *b*, until the buckets pass the front center of wheels C C and leave guide *b*, when, by the action of the water and use of lugs *d d*, the back and upper edge of the bucket falls back into the cut in wheel C, and is guided by its movement until it is about to leave the cut in the wheel, when lugs *d d* upon each end of the axle will take their direction in the slot provided for the purpose of holding the paddles in an upright position. When the paddles have reached the wheels D D, the lugs leave the slots, and the paddles are guided by wheels D D until they reach the upper front center, when they will pass under or over guide *b*, and lie nearly parallel with the chain, until they reach the lower front center of wheels C C, when guide *C'*, from its particular shape and bearing on the edge of the buckets, guides them in their proper direction until they leave guide *b* and guided by wheels C C, and so they go the rounds. I may place guide *b* on the under side of the bucket or paddles.

I deem it important that no more paddles should be left in working position than are absolutely necessary, as when the water gets fully under motion the rear paddles are of no service.

I do not claim, as does James Burson, the plates for holding the guide-rods in four angular positions, &c. Neither do I claim what Edward Whitehead does, a divided channel, &c. Neither do I claim placing it in the bow of a boat, as I may place it back of the bow; but

What I do claim, and desire to secure by Letters Patent, is—

1. The sprocket-wheels C C when shaped to receive and sustain the paddles in their movements, as set forth and described.
2. The sprocket-wheels C C and D D, in combination with the chain *c c c*, substantially as and for the purposes set forth.

E. P. RUSSELL.

Witnesses present:

C. W. SMITH,
CLINTON SMITH.