(139.)

Matthew K. Wildman. Impt in Means of Propulsion for Vessels on Canals &c.

No. 122,301. Patented Dec. 26, 1871.

Fig: 1.

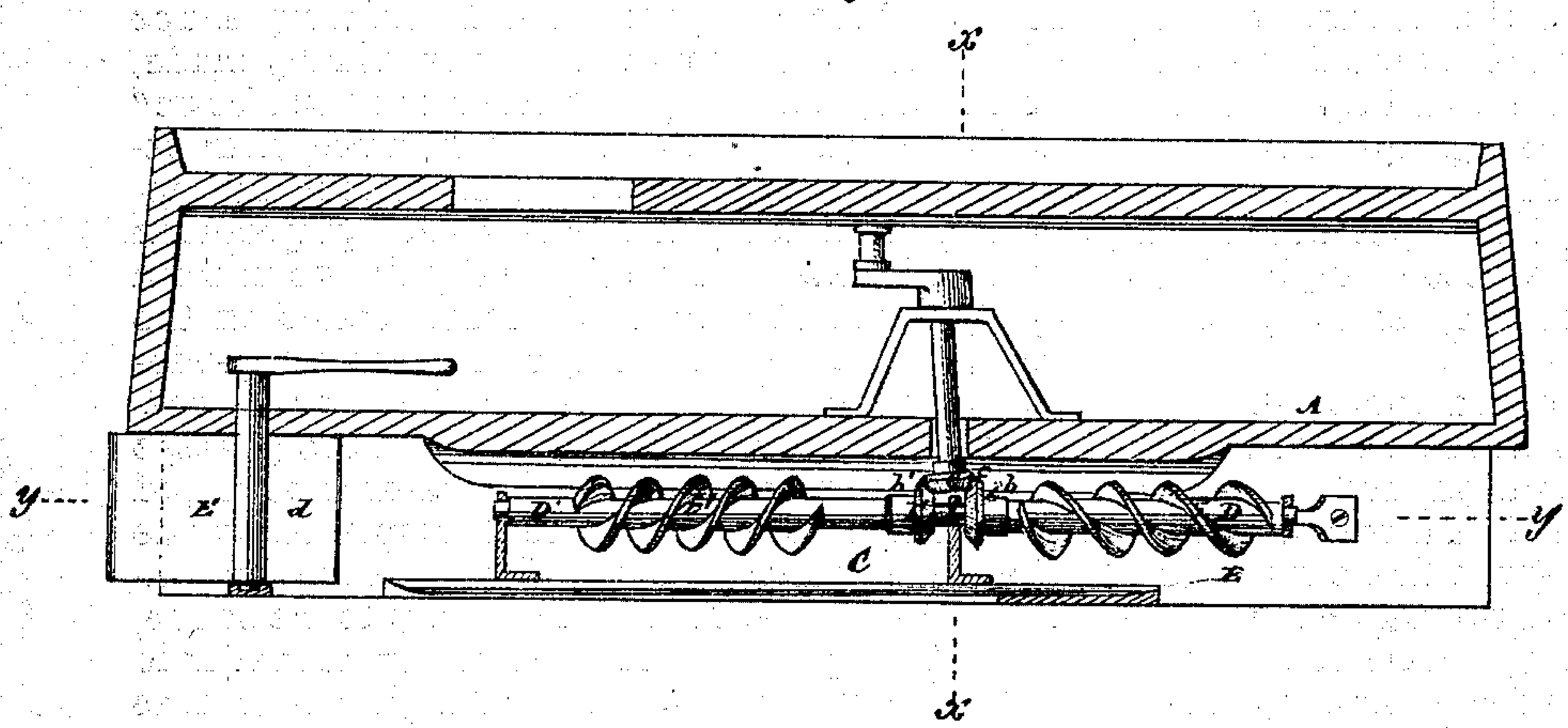


Fig: 2.

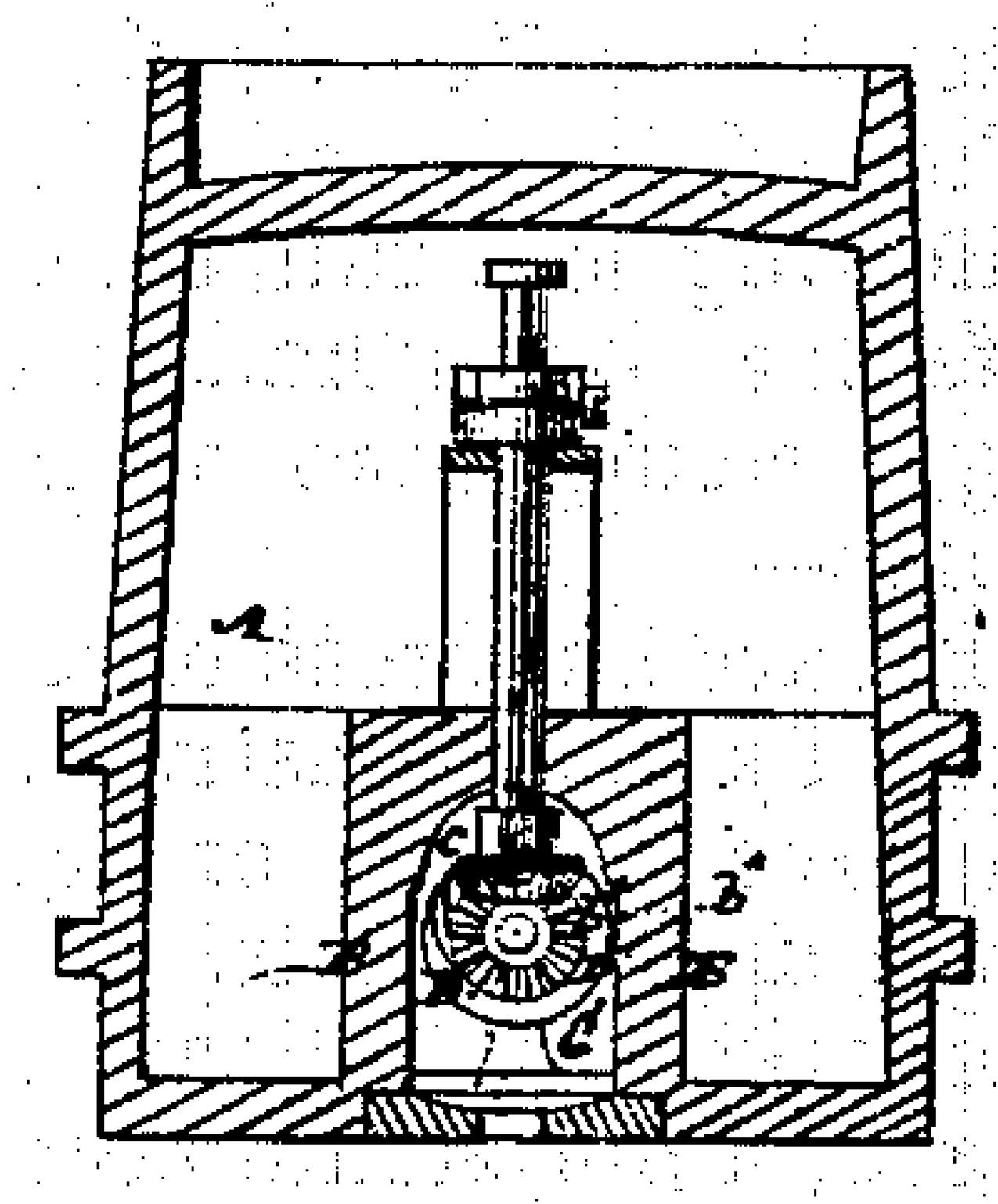


Fig: 3.

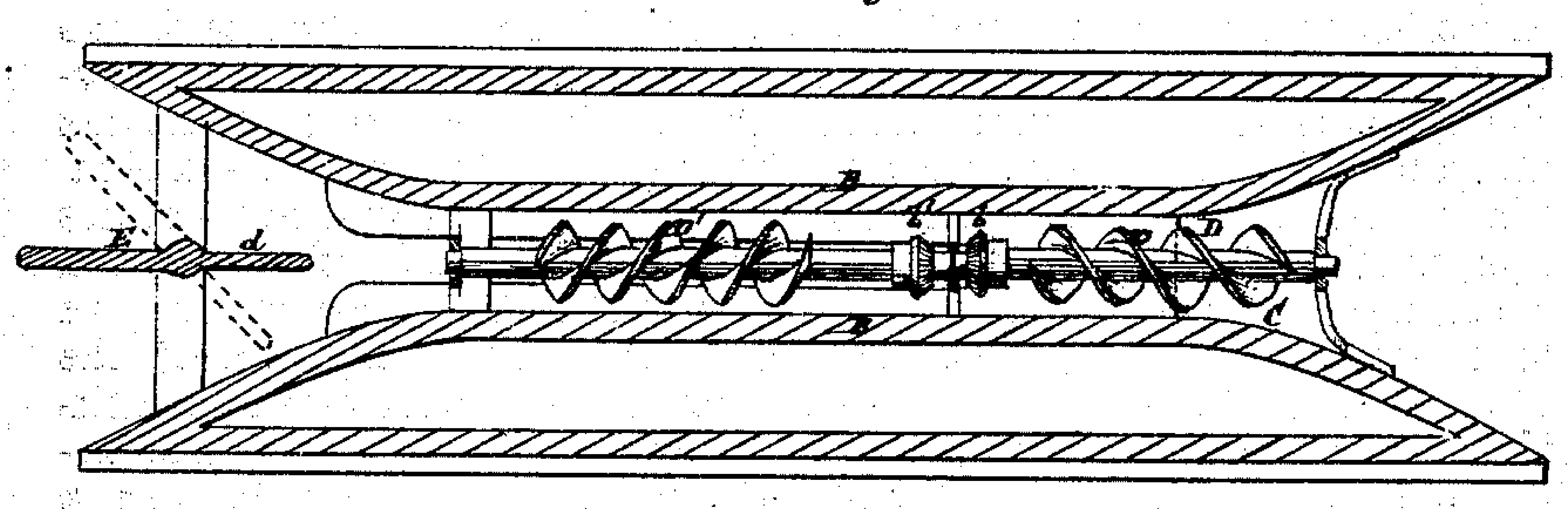
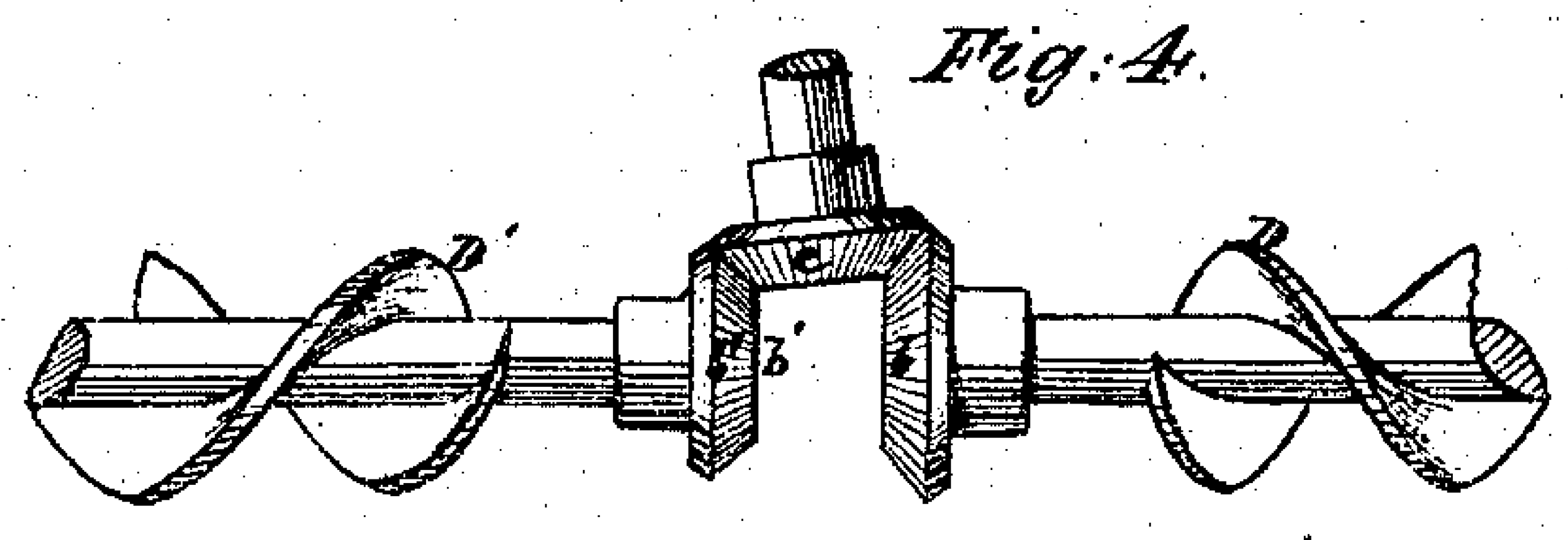


Fig: 4.



Witnesses:

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MATTHEW K. WILDMAN, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN PROPELLING VESSELS.

Specification forming part of Letters Patent No. 122,301, dated December 26, 1871.

To all whom it may concern:

Be it known that I, MATTHEW K. WILDMAN, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Means of Propulsion Applicable to Vessels for Navigating Canals and other Waters; and I do hereby declare that the following is a full, clear, and exact description, reference being had to the accompanying drawing forming part of this specification, and in which—

Figure 1 represents a vertical longitudinal section of a boat constructed in accordance with my improved means of propulsion, and having the same applied to it. Fig. 2 is a transverse section taken as indicated by the line *x x* in Fig. 1. Fig. 3, a horizontal section through the line *y y*. Fig. 4 is a view on a larger scale of a divided propeller in part, with its connecting gearing.

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

My invention is designed more especially for boats or vessels to be used on canals and other narrow waters, in which, among other objects to be gained, it is desirable to guard against the washing of the banks by the action of a propeller applied to the boat, and worked by steam or other motive power. To this and other ends my invention consists of two reversely-pitched screw-propellers, geared to rotate in opposite directions, one in front of the other, and so that the rear one revolves faster than the forward one, which prevents choking of the latter by back-water. The boat also has its rudder arranged within the rear end of the water-course or passage between the two longitudinally-arranged hull sections, and is preferably constructed so that it may be turned to wholly close the passage on either side of the boat, whereby increased facility is afforded for steering or turning the boat.

Referring to the accompanying drawing, A represents the hull of a boat suitable for navigating canals and other narrow waters, and which may be formed with straight or flat sides on its exterior. The lower portion of the boat is divided into two hull sections, B B, constructed to form a longitudinal water-course or passage, C, between them, and extending centrally through the boat from bow to stern. This passage C, as formed by the inner walls of the hull sections B B, is of peculiar construction, being made to correspond with or approximate the ordinary shape of the bow and run of a boat as usually made, and having what may be termed two "sub bows" and two "sub sterns," so that on a propeller being arranged between said hull sections, and operate to take the water in front and project it in rear, the water will be gradually drawn in from opposite sides in front and concentrated on the propeller and be discharged in a gradually-widening or spreading manner in the rear, by reason of the laterally-flaring shape of the passage C at the bow and stern. The water thus forced back takes the place of that displaced by the boat, free from that excessive agitation and lateral disturbance, occasioning injury to the banks, that takes place when a wheel or propeller is used to throw the water in a straight line or lines in rear of the boat. The propeller is preferably divided or made to consist of two spiral shafts or screws, D D′, arranged, one in advance of the other, within the passage C, and with their screw-blades set in reverse directions, so that the one screw is right-handed and the other left-handed. These screws or propellers are geared to rotate in reverse directions at different velocities, and so that the rear propeller D′ moves faster than the forward screw or propeller D, whereby the rear propeller relieves the forward one, and choking by back-water is avoided. This reverse action of the propellers, which combined form a single propeller, also prevents "slipping" of the water over or by the latter, and such reverse action at different velocities I propose to attain in a very simple manner, by arranging on the inner or adjacent ends of the propellers bevel-wheels or pinions *b b′*, of slightly different diameters, or having an unequal number of teeth in them, but in gear with a driving-wheel or pinion, *c*, common to both. The rudder E is arranged in the rear flaring portion of the passage C, so as to be out of the way and protected, as in the case of a canal-boat, when passing through locks, and said rudder provided with an inner or reverse and additional wing, *d*, that produces in a measure a counterbalancing action of the water on the rudder, which is of such proportions that when fully turned to the right or to the left it is made to re-

strict the outflow from the passage C to one side only of the boat by the contact or approximate position of the wing *d* with the one rear flaring side of the passage C. This materially assists in the steering of the vessel, and adds to the efficiency of the propeller for steering purposes.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The propellers D D′, arranged one in advance of the other, and of opposite pitch, as described, made to rotate in reverse directions at different velocities, by means of the differential gear *b b′* and *c*, essentially as herein set forth.

2. The arrangement of the rudder E within the rear end of the passage C, between the hull sections, so as to be capable of wholly closing either side of the outlet of said passage, substantially as shown and described, for the purpose set forth.

MATTHEW K. WILDMAN.

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