

No. 102,111.

PATENTED APR. 19, 1870

E. D. GIRD.
SCREW PROPULSION FOR TUG BOATS.

Fig. 1.

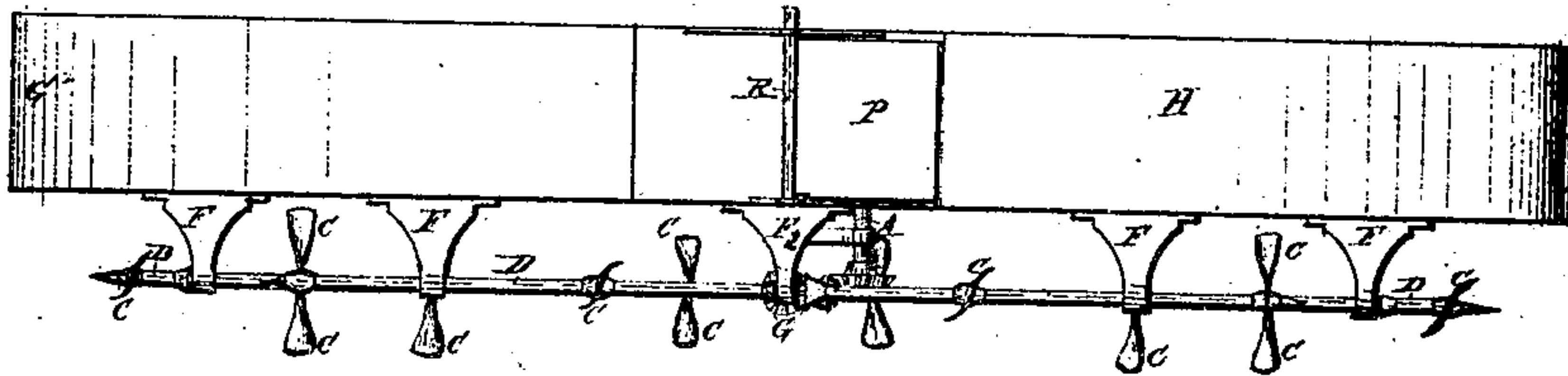


Fig. 2.

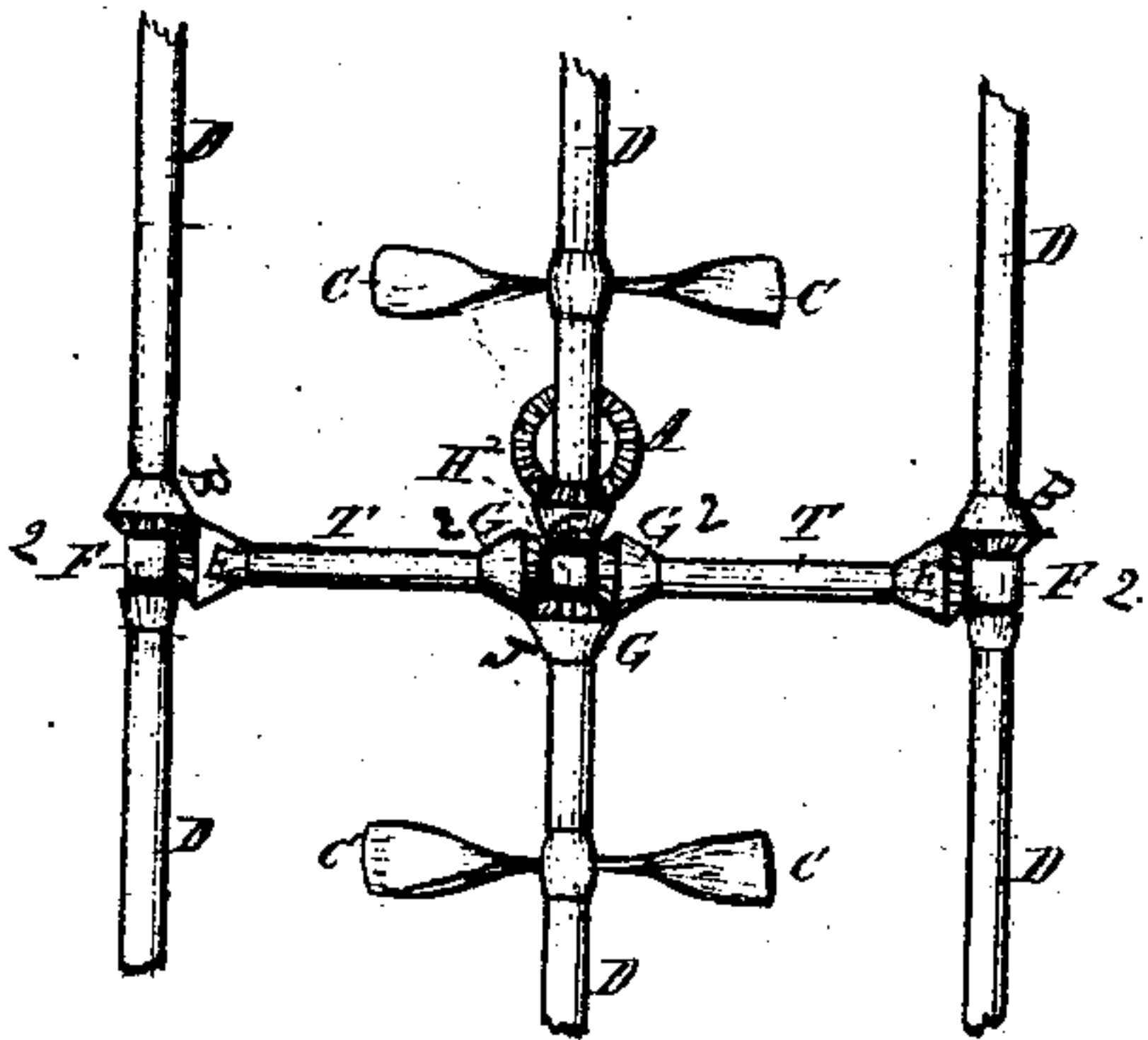
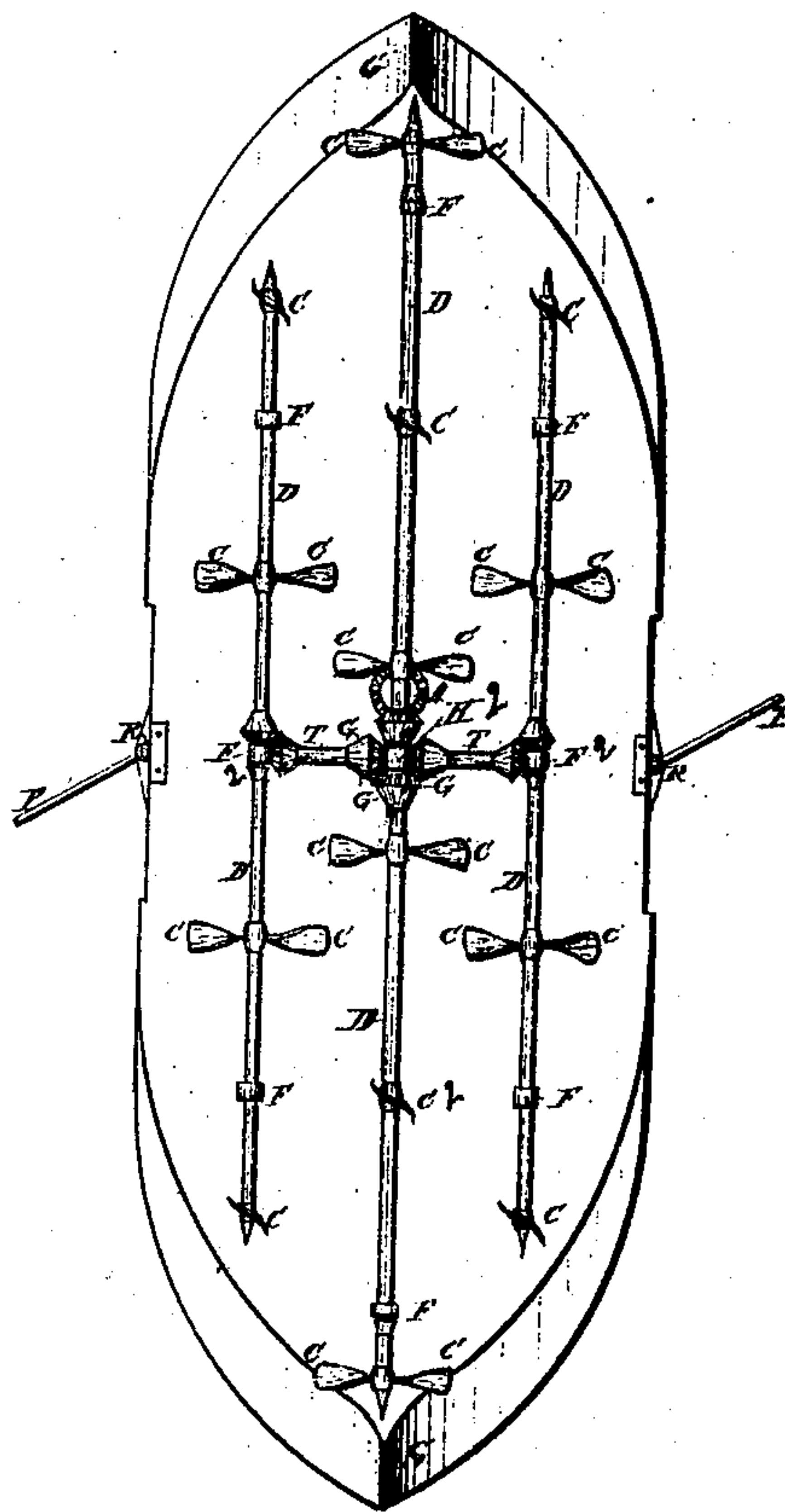


Fig. 3.



Witnesses.

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IMPROVEMENT IN SCREW PROPULSION FOR TUG-BOATS.

The Schedule referred to in these Letters Patent and making part of the same

Be it known that I, EDWARD D. GIRD, of the city of Syracuse, county of Onondaga and State of New York, have invented a new and useful Improvement in Tug-Boats; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and the letters of reference marked thereon.

The nature of my invention consists in the construction of a flat-bottomed tug-boat, with reversible rudders on its sides, and whose ends are like, with its machinery so constructed as to admit of its running equally well in either direction; the distributing of the propelling fans or leaves over the entire area of the bottom of the boat, secured upon rods or shafts in such a manner as to distribute the force equally upon the column of water acted upon; the revolving of these propelling-leaves or fans by means of beveled gears and connecting-shafts, sustained by single and double-journalled hangers, as hereinafter described.

Figure 1 of the drawings is a side view of the boat, with the propelling apparatus attached.

Figure 2 shows the arrangement and operation of the beveled gearing.

Figure 3 represents the bottom of the boat and the position of the fans upon the shafts.

H, fig. 1, represents the hull or body of the boat, constructed with a flat bottom, for the purpose of making it of light draught, and to permit the attachment of the propelling-shafts, as hereinafter shown.

The ends are made similar to each other in form, as shown at G G, fig. 3.

The shafts D D, to which the fans C C C are attached, are suspended to the bottom of the boat by hangers F F, and run parallel with the bottom and with each other, at such distances apart as will allow the fans C C C to operate upon a column of water equal in width to that of the bottom of the boat. The fans are attached to the shafts by a double cone-shaped hub, and the shafts are made pointed at their ends, in order to afford as little resistance as possible to the water. The hangers attaching the shafts to the boat are also made with sharp edges, for the same purpose.

The hangers F² F² are provided with journals, to admit the ends of the shafts T T. Their opposite ends journal into the central hanger H².

The fans are so situated that the arms of each will operate in the space between the fans on the adjacent shaft, as shown in fig. 3, C², and are so placed on the shafts that the angle of each differs from that of all the others.

Motion is imparted to these shafts by means of the

bevel-gear A, fig. 2, also shown in fig. 1. This bevel-gear is on the end of an upright shaft, which extends through the bottom of the boat, and is connected and operated by the machinery above. This gear meshes into the gear-wheel G, which revolves the shaft D, fig. 2. The bevel-gear J, shown upon the same shaft, meshes into the bevel-gear G² G², which turns the short or transmitting-shafts T T. The bevel-gear E, upon the end of this shaft, meshes into the bevel-gear B, thus imparting a uniform motion to all of the shafts.

The rudders P P, fig. 3, are situated in the center of each side of the boat, and are swung upon the pivots R R, so as to enable them to turn either way, to correspond with the direction of the boat, and are let into its sides, so that, when closed, they are protected and present a smooth and unobstructed surface. The object of their being so placed is to avoid the danger of contact to which they would be liable if at the ends, and also to render them more effective for steering purposes than in the other position, owing to the lightness of draught.

The advantages gained by this boat are—

First, the propeller fans are made to operate upon so heavy a column of water that the same will not be put in rapid motion, and consequently will not injure the canal banks by washing.

Second, the boat being a double-ender, and the machinery so arranged that it is propelled in either direction with equal facility, enables it to overcome the difficulty heretofore existing, viz, waste of time, occasioned by turning or backing, when drawing a tug of boats in or out of a lock, and also the facility with which boats can be stopped or started by pushing against them, either end being used as a ram.

Having thus described my invention,

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

1. The double-ended flat-bottomed hull H, in connection with the reversible rudders P P, situated on and let into the sides of the same, substantially as described and shown.

2. The shafts D D D, carrying the propellers C C C, in combination with the hangers F² F² and H², the bevel-gears B B, G G G, and E E, the transmitting-shafts T T, and the vertical shaft and gear-wheel A, arranged and operated substantially as described and for the purpose set forth.

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Witnesses:

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