T. W. PRATT.

Mechanism for Propelling Boats.

No. 164,033. Patented June 1, 1875.

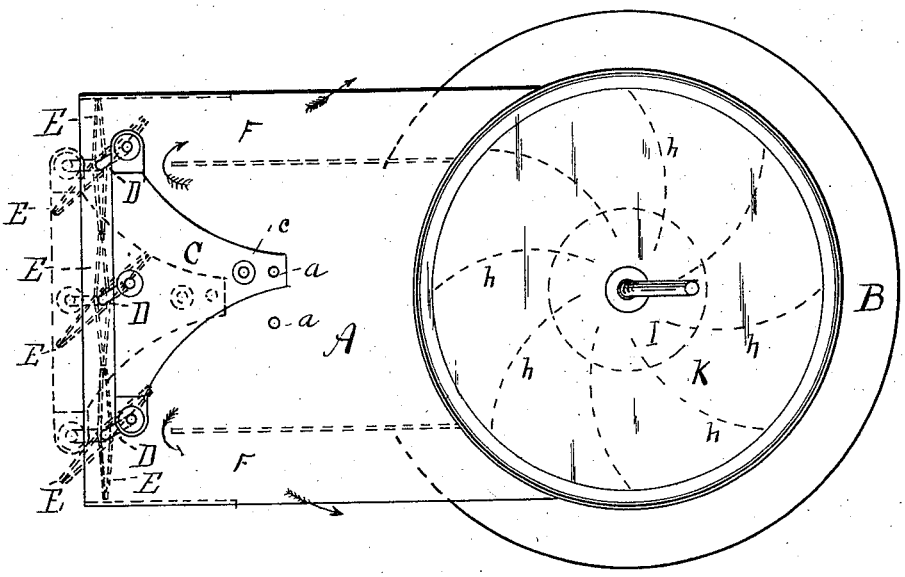

Fig. 1

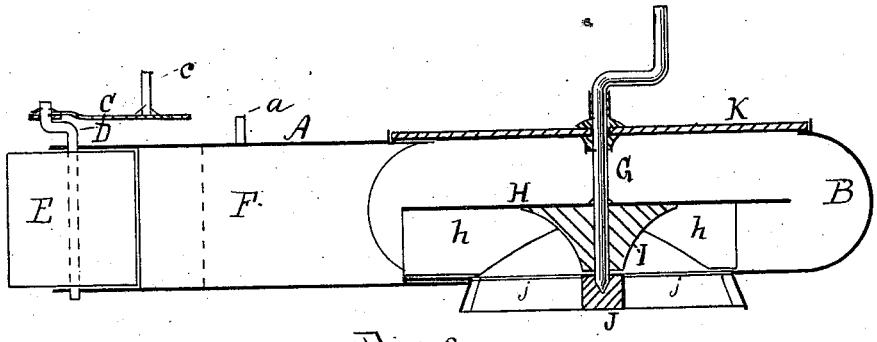

Fig. 2

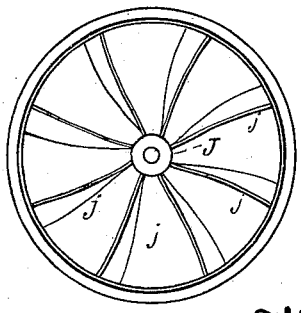

Fig. 3

Witnesses:
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UNITED STATES PATENT OFFICE.

T. WILLIS PRATT, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN MECHANISMS FOR PROPELLING BOATS.

Specification forming part of Letters Patent No. **164,033**, dated June 1, 1875; application filed March 5, 1875.

To all whom it may concern:

Be it known that I, T. WILLIS PRATT, of Boston, in the county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Propellers for Steamships, &c., of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which my invention appertains to make and use the same, reference being had to the accompanying drawing forming a part of this specification, in which—

Figure 1 is a plan of my improved propeller; Fig. 2, a longitudinal vertical section of the same; and Fig. 3, a view of the abutments.

Like letters of reference indicate corresponding parts in the different figures of the drawing.

My invention relates to that class of propellers in which a jet of water is ejected by means of a hydraulic wheel near or through the stern of the vessel: and consists in a novel construction and arrangement of the parts, as hereinafter more fully set forth and claimed, by which a simpler, cheaper, and more effective device of this character is produced than has heretofore been employed.

It is well known that various attempts have been made to propel vessels upon this principle, all of which, so far as I have any knowledge, have failed for various reasons, but primarily on account of the small jet ejected, necessitating the use of wheels running at a high rate of speed, and consequently great loss of power; and, secondly, the large amount of friction produced by discharging the water in comparatively small quantities through crooked passages.

My improvement is designed to obviate these difficulties and objections; and to that end I construct and arrange the propeller in a manner which will be readily understood by all conversant with such matters from the following description:

This propeller is made somewhat in the form of a turbine water-wheel, the blades or fins being supported vertically by a horizontal circular plate or disk, through the center of which the main shaft passes, and to which it is firmly attached. The lower end of the shaft is supported by a step, and the upper end has a crank to which the power is applied. The propeller is inclosed in a metallic case, which is designed to be placed close to the bottom of the hull of the vessel, and near to the stern. An opening through the bottom of the case and hull admits water freely, and another opening at the stern allows the water to be ejected through a trunk or eduction-pipe connected with the case. In the lower orifice is placed a circular or scroll abutment having curved inclined slots like a fan-blind, and which serve three purposes: First, as a screen to prevent large foreign objects from passing to the wheel; second, to give the current of water a direction favorable to the motion of the wheel; and, third, to furnish a support for the step of the main shaft. The blades of the propeller are curved backward from the direction of motion, as they extend from the center of the disk to give more effect to the centrifugal force. The casing is considerably larger than the wheel to allow the water free motion until it is thrown out at the ejection-orifice, which is made rectangular in form, with a supplemental orifice upon each side.

For steering purposes three valve-rudders are placed in the mouth of the main ejection-orifice, which are pivoted or journaled vertically on their centers by means of crank-shafts which extend above the eduction-pipe, the cranks being so connected by a plate or bar as to permit the rudders to be operated conjointly and maintained parallel with each other or placed in a line across the mouth of the opening. When the rudders are placed in a line, as described, or so as to close the mouth of the main orifice, the water will be turned backward, as shown by the arrows, through the side or supplemental orifices, and the current being reversed, give a backward motion to the vessel, thus obviating the necessity of reversing the engines.

It will be obvious that there are many advantages obtained by my improved propeller over side wheels or screws. It is entirely submerged, and all its blades work in the same depth of water. Its action is nearer to the center of gravity of the weight to be moved, and always working in a uniform quantity of water without shock or tendency to "race," dispensing with the use of marine governors, and,

of course, rendering the machinery less liable to accident.

In the drawing, A is the trunk or main eduction-pipe; B, the case in which the wheel is disposed; C, the plate or bar connecting the crank-shafts; D, the cranks; E E E, the rudders or valves; *c*, the rudder-post; *a*, cap-stand posts; F F, the supplemental orifices or eduction-pipes; H, the disk of the wheel; *h h*, the fins; G, the wheel-shaft; I, an inverted cone arranged around the shaft G above and between the fins, for turning or deflecting the current of water as it is drawn in by the revolutions of the wheel; J, the step in which the shaft G is supported; and *j j*, the curved and inclined abutments through which the water passes to the wheel.

In the construction of the trunk and all other parts of the apparatus the conduits or water-passages are made as large in cross-section and as short as possible, the object being to lessen the friction, reduce the speed of the wheel, and eject the water at a velocity exceeding but little the speed of the vessel.

Having thus described my improvement, what I claim is—

1. In a mechanism for propelling vessels, the case B, provided with the horizontal wheel H, having the blades *h h*, curving backward from the direction of motion, in combination with the curved abutments *j j* and the deflector I, all constructed and arranged substantially as and for the purpose set forth.

2. In a mechanism for propelling vessels, the case B, constructed substantially as described, and provided with the horizontal wheel H, in combination with the eduction-pipe A, valves E E E, and supplemental orifices F F, all constructed and arranged substantially as and for the purpose set forth.

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Witnesses:

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