(No Model.) 3 Sheets—Sheet 1.

S. W. BARNABY

PROPELLER.

No. 486,366. Patented Nov. 15, 1892.

Fig. 1.

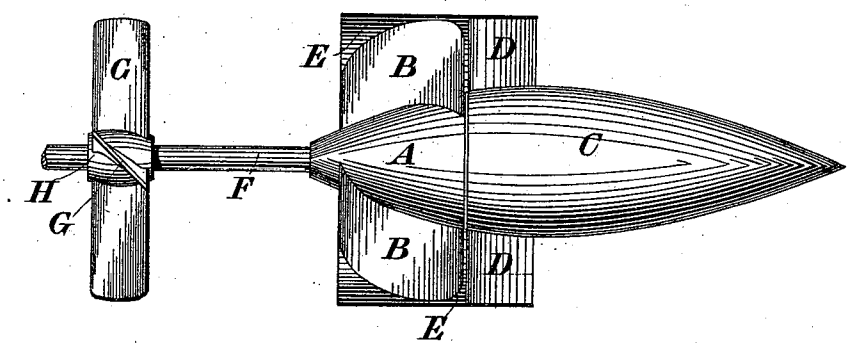


Fig. 2.

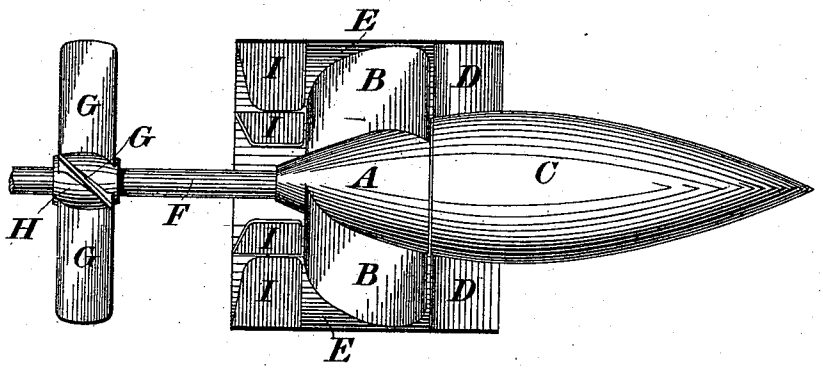
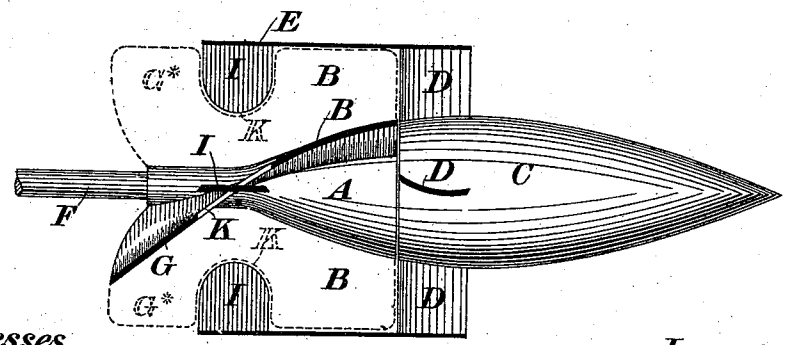


Fig. 3.



Witnesses
C. C. Duffy
Hubert E. Peck.

Inventor
S. W. Barnaby
per P. C. Duffy Atty

(No Model.) 3 Sheets—Sheet 2.

S. W. BARNABY.

PROPELLER.

No. 486,366. Patented Nov. 15, 1892.

Fig. 6.

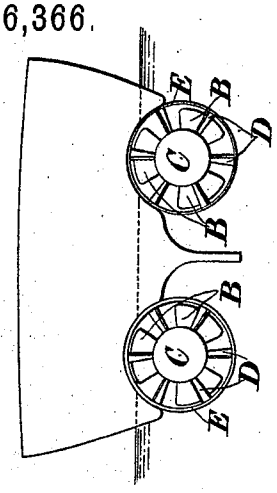


Fig. 4.

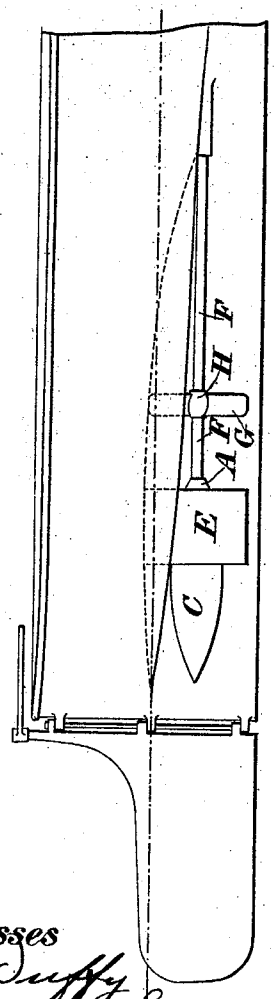
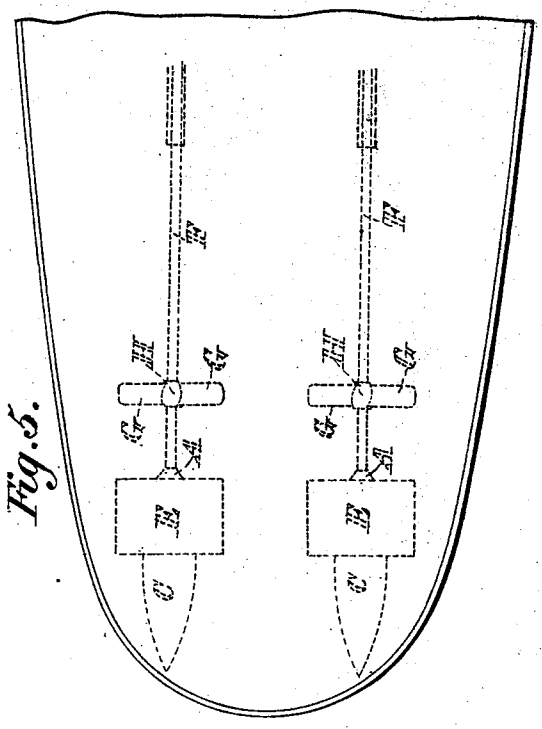


Fig. 5.



Witnesses
E. C. Duffy
Hubert E. Peck

Inventor
per S. W. Barnaby
C. C. Duffy Atty

(No Model.) 3 Sheets—Sheet 3.

S. W. BARNABY.

PROPELLER.

No. 486,366. Patented Nov. 15, 1892.

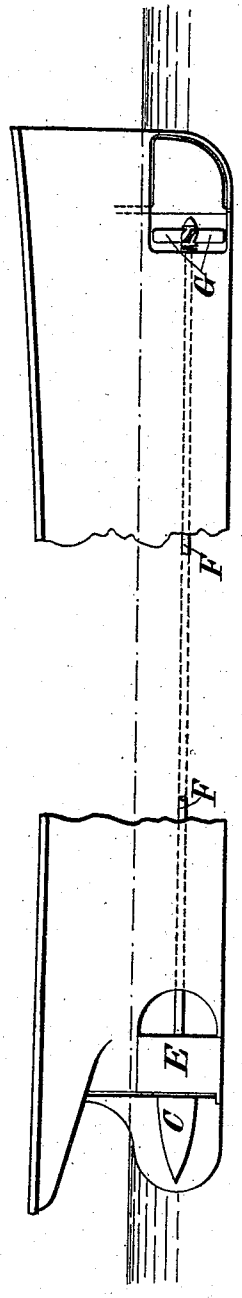


Fig. 7

Witnesses
E. B. Duffy
Herbert E. Peck

Inventor
S. W. Barnaby
per
O. E. Duffy atty

UNITED STATES PATENT OFFICE.

SYDNEY WALKER BARNABY, OF LONDON, ENGLAND, ASSIGNOR TO JOHN ISAAC THORNYCROFT, OF SAME PLACE.

PROPELLER.

SPECIFICATION forming part of Letters Patent No. 486,366, dated November 15, 1892.

Application filed March 23, 1892. Serial No. 426,115. (No model.) Patented in France March 16, 1892, No. 220,191, and in India August 5, 1892.

To all whom it may concern:

Be it known that I, SYDNEY WALKER BARNABY, a subject of the Queen of Great Britain and Ireland, residing at Chiswick Mall, London, in the county of Middlesex, England, have invented Improvements in Propelling and Steering Apparatus for Ships or Vessels, (for which I have obtained Letters Patent in France, No. 220,191, dated March 16, 1892, and in India, dated August 5, 1892,) of which the following is a specification.

This invention is designed to adapt for going readily astern (as well as ahead) vessels fitted with propelling and steering apparatus of the kind described in the specifications of the English patents, No. 1,330, of the year 1879, and No. 1,853, of the year 1881, both granted to John Isaac Thornycroft. The said apparatus can be constructed in various forms, as is well known, and the present invention can be applied in conjunction with various arrangements of the said propelling and steering apparatus, hereinafter called for distinction the "Thornycroft propeller," of which some arrangements are illustrated, by way of example, in the accompanying drawings.

Referring to the drawings, Figures 1, 2, and 3 show three modifications of the present invention. Each figure is a side elevation, partly in section. Fig. 4 is a side elevation of the after portion of a twin-propeller vessel adapted for shallow water and having this invention applied to it. Fig. 5 is a plan of the same, and Fig. 6 is a transverse section. Fig. 7 illustrates a modification.

As will be seen in each arrangement, the Thornycroft propeller comprises, essentially, a propeller A B having behind it and arranged in line with its boss A a body C, (hereinafter called the "rearward body,") that has a gradually-increasing diameter or width for a short distance and afterward a gradually-diminishing diameter or width to its rearward end, and is furnished with guide-plates or blades D, for gradually deflecting and directing the water projected from the propeller A B into a direction approximately parallel with the axis of the rearward body C, the said propeller A B, rearward body C, and guide plates or blades D being surrounded by a fixed pipe, tube, case, or hollow guide E, (hereinafter called a "tube.")

Now in order that a navigable vessel fitted with the Thornycroft propeller may be made capable of readily going astern when necessary, according to the present invention, supplementary blades (constituting a stern propeller or propellers) are arranged in conjunction with or combined with the Thornycroft propeller and its shaft F, and these supplementary blades are arranged so as to be outside of and at the forward end of the tube E. The supplementary blades G may be carried by a boss H, (or bosses,) mounted on the same shaft F as the propeller A B, so as to be directly in front of but separate from the propeller A B, Figs. 1 and 2; or, instead of forming a separate propeller G H, the screw-blades of the Thornycroft propeller A B may be formed with prolongations or extensions $G^{\times}$, that extend some distance beyond the forward end of the tube E, Fig. 3. In either case it is advantageous that the screw-blades G, Figs. 1 and 2, or the portion $G^{\times}$ of the screw-blades A B, Fig. 3, that are external to the tube E should be of such a uniform pitch that during the forward movement of the vessel caused by the Thornycroft propeller the said supplementary blades G or part blades $G^{\times}$ shall neither assist nor retard the action of the Thornycroft propeller. When, however, the blades G or blades B $G^{\times}$ are rotated in the opposite direction to that in which they are rotated when going "ahead," water will have free access to them and the vessel will be caused to go astern.

To destroy or lessen the rotary movement of the annular stream of water forced in a forward direction through the tube E by the Thornycroft propeller when going astern, the forward end of the tube E is (or may be) provided with a number of straight guide plates or blades I, arranged within the tube E, as shown, or they may be external to the tube. When one propeller only is used having its screw-blades prolonged outward and forward, as set forth, these blades must be suitably recessed or cut away near the outer edges K, Fig. 3, so as to clear the fixed radial blades or plates L.

In Fig. 7 the shaft F is prolonged to the forward end of the vessel and the supplementary blades G are fixed upon that end of the shaft.

What I claim is—

1. In propelling and steering apparatus for navigable vessels, the combination, with a screw-propeller and a fixed tube within which said propeller can rotate, of supplementary screw-blades mounted to rotate with said screw-propeller and arranged outside of and forward of said tube, substantially as herein described, and for the purpose specified.

2. In propelling and steering apparatus for navigable vessels, the combination of a screw-propeller, a fixed tube within which said screw-propeller can rotate, supplementary screw-blades mounted to rotate with said screw-propeller and arranged outside of and in front of said tube, and inwardly-projecting straight guide plates or blades fixed to the forward end of said tube, substantially as herein described, for the purpose specified.

3. In propelling and steering apparatus for navigable vessels, the combination, with a propeller comprising a screw-propeller, a rearward body of the kind herein described arranged in line with and behind said screw-propeller and provided with guide plates or blades, and a fixed tube surrounding said screw-propeller and rearward body, of supplementary screw-blades mounted to rotate with said screw-propeller and arranged outside of and at the forward end of said tube, substantially as herein described, for the purpose specified.

4. In propelling and steering apparatus for navigable vessels, the combination with a propeller comprising a screw-propeller, a rearward body and a tube provided at its rear end with guide plates or blades and within which said screw-propeller can rotate, of supplementary screw-blades carried by a separate boss fixed on the shaft carrying said screw-propeller and arranged outside of and in front of said tube, and guide plates or blades fixed to the forward end of said tube, substantially as herein described, for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SYDNEY WALKER BARNABY.

Witnesses:

ARTHUR WOOSNAM,
46 *Lincoln's Inn Fields, W. C.*

WM. THOS. MARSHALL,
Gentn., 2 Pope's Head Alley, Cornhill, London.