

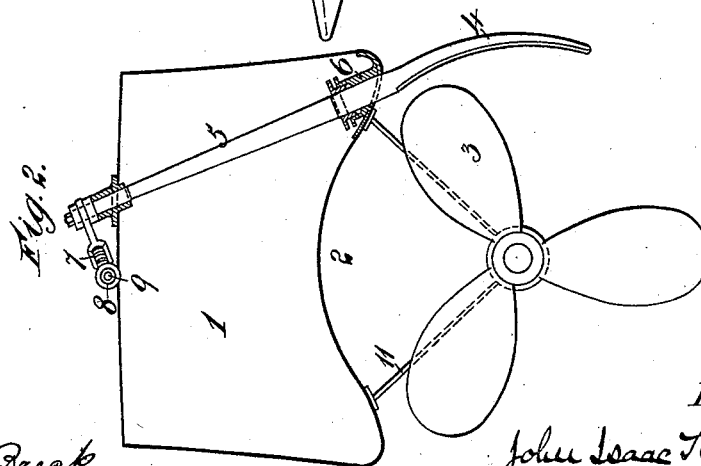
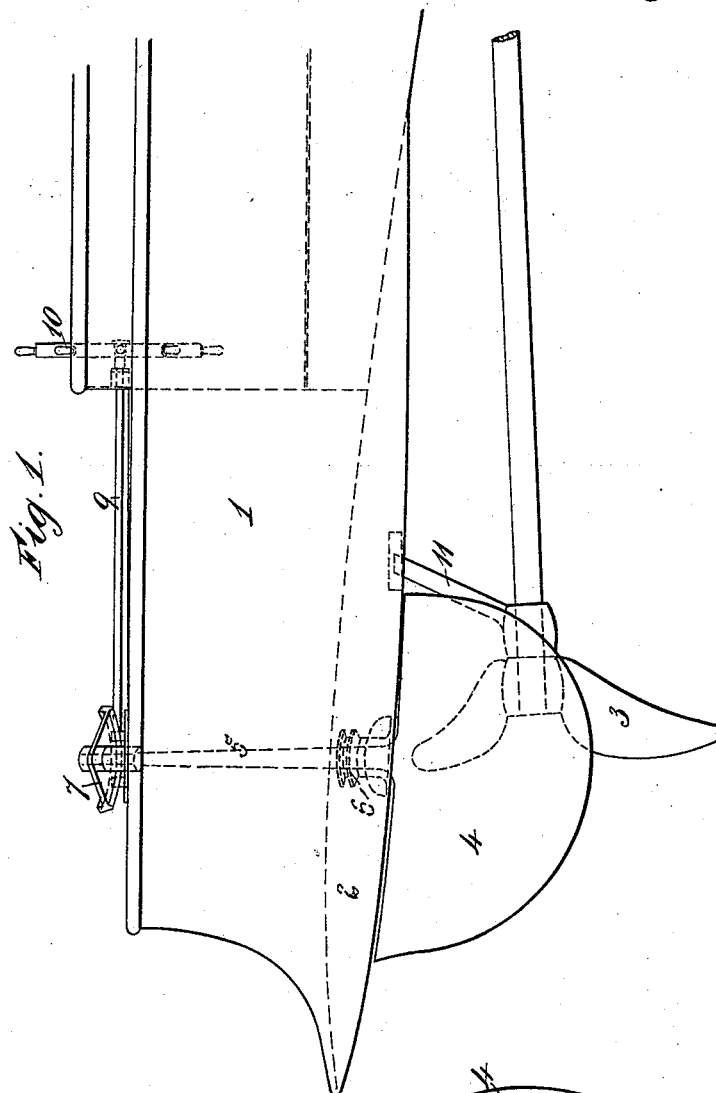
(No Model.)

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RUDDER FOR STEERING VESSELS.

No. 348,070.

Patented Aug. 24, 1886.



Witnesses

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Chas. J. Maguire

Inventor

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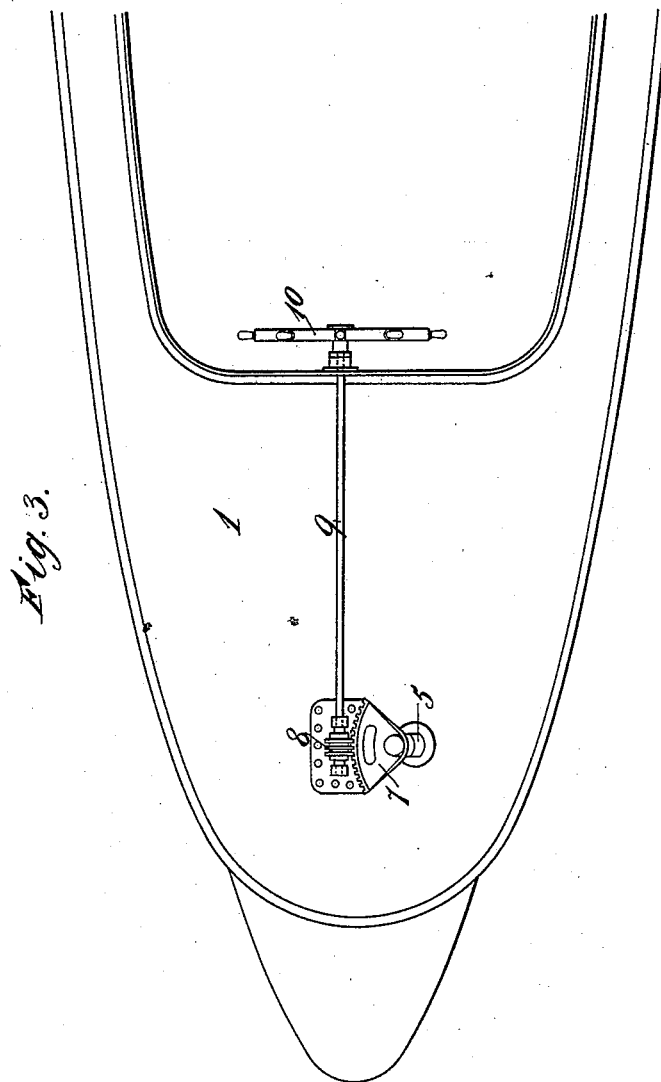
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# UNITED STATES PATENT OFFICE.

JOHN ISAAC THORNYCROFT, OF CHISWICK, COUNTY OF MIDDLESEX,  
ENGLAND.

## RUDDER FOR STEERING VESSELS.

SPECIFICATION forming part of Letters Patent No. 348,070, dated August 24, 1886.

Application filed November 25, 1885. Serial No. 183,915. (No model.) Patented in France October 7, 1885, No. 171,531; in Sweden October 13, 1885, No. 341; in Italy December 31, 1885, XXXVII, 27, XXXVII, 427; in Canada January 18, 1886, No. 23,232, and in Austria-Hungary March 18, 1886, No. 42,419.

*To all whom it may concern:*

Be it known that I, JOHN ISAAC THORNYCROFT, a subject of the Queen of Great Britain and Ireland, and residing at Chiswick, in the county of Middlesex, Kingdom of Great Britain and Ireland, have invented new and useful Improved Arrangements for Steering Vessels, (for which I have received Letters Patent in Sweden, No. 341, dated October 13, 1885; France, by certificate of addition, dated November 17, 1885, to Patent No. 171,531, dated October 7, 1885; Canada, No. 23,232, dated January 18, 1886; Italy, by certificate of addition dated December 31, 1885, Reg. Att. Vol. XXXVII, No. 27, to patent dated December 31, 1885, Reg. Att. Vol. XXXVII, No. 427,) of which the following is a specification.

The drawings hereunto annexed illustrate a modification of the invention described in the specification of my application for Letters Patent filed on the 20th day of October, 1885, Serial No. 180,400.

Figure 1 is a side elevation, Fig. 2 an end elevation, and Fig. 3 a plan or top view, of a navigable vessel with my present arrangement of steering apparatus.

As described in my said previous specification, a navigable vessel constructed with an external hollow or recess at the under part of the stern, to partly receive the propeller or propellers, is provided at each side thereof with a rudder, the two rudders being connected in such a manner as to operate simultaneously.

Now, my present invention has for its object to enable a vessel to be efficiently steered by a somewhat more simple and compact arrangement of parts than illustrated in the previous specification.

1 is the vessel; 2, the external hollow or recess at the under part of the stern, and 3 a screw-propeller situated partly within the hollow or recess 2. According to my present arrangement only one rudder, 4, is used. This single rudder in the modification illustrated is of curved form in vertical transverse section. It is arranged at one side of the propeller in such a manner that when the propeller is driven,

whether ahead or astern, water leaving it will act upon the rudder.

5 is the rudder-head, extending upward through a stuffing-box, 6, and provided at its upper end with a toothed sector, 7, in gear with a worm, 8, on a shaft, 9, operated by a hand-wheel, 10. As shown in the drawings, the axis about which the rudder turns is inclined to a vertical plane coincident with the longitudinal center line of the vessel, which arrangement admits of the parts being compactly situated and conveniently operated; but the axis may be vertical, if desired.

The rudder may be operated in any other convenient manner than that illustrated.

11 is a frame or support for carrying the outer portion of the propeller-shaft.

As I have already pointed out, my present invention differs from that described and claimed in my previous application filed October 20, 1885, Serial No. 180,400, in that the present case covers a single rudder arranged on one side of the propeller, whereas the former case covers two rudders, one on each side of the propeller. The single-rudder arrangement is applicable in many cases where simplicity and cheapness are important—for example, in the case of small vessels—while the double-rudder arrangement, by which, of course, a more powerful steering effect may be obtained, is applicable to larger vessels.

What I claim is—

1. In a navigable vessel, the combination, with a propeller or propellers, of a rudder situated on one side thereof, projecting or extending above as well as forward and abaft of said propeller or propellers, substantially as described.

2. A navigable vessel constructed with an external hollow or recess at the under part of the stern, and having a propeller or propellers arranged to revolve in or partly in said recess, in combination with a rudder situated abreast of said propeller or propellers on one side thereof, substantially as described.

3. In a navigable vessel, the combination, with a propeller or propellers, of a rudder situated on one side thereof, which rudder has

the form of a hollow cylinder, the axis of which is practically coincident with the propeller-shaft, substantially as described.

4. In a navigable vessel, the combination,  
5 with a propeller or propellers, of a rudder situated on oneside thereof, the axis about which said rudder turns being inclined toward a vertical line through the propeller-shaft, and being situated in a vertical plane perpendicular

to the propeller-shaft, whereby the parts may be more compactly arranged, substantially as described.

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