(No Model.)

C. W. FIELD, Jr.

SCREW PROPELLED VESSEL.

No. 332,243. Patented Dec. 15, 1885.

Fig. 1.

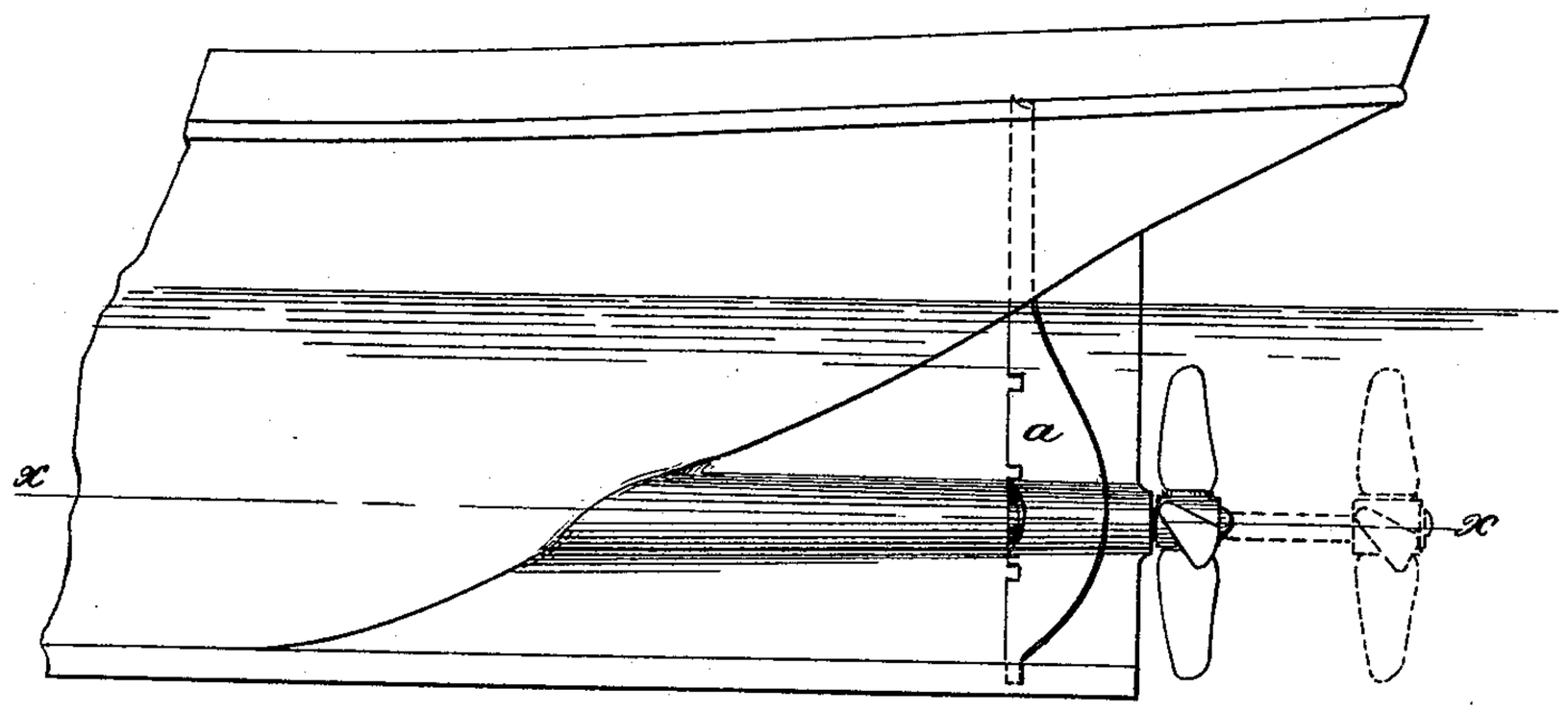


Fig. 2.

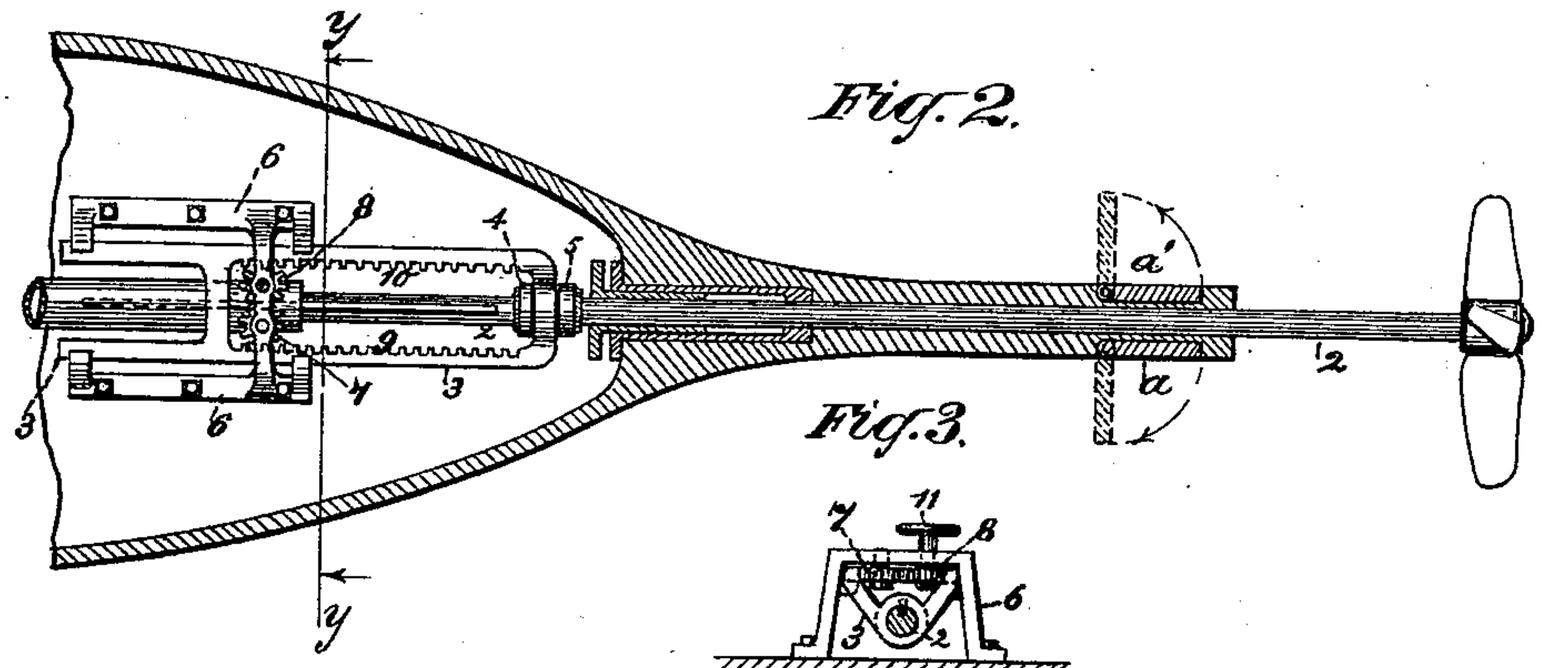


Fig. 3.

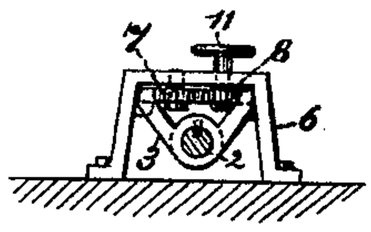
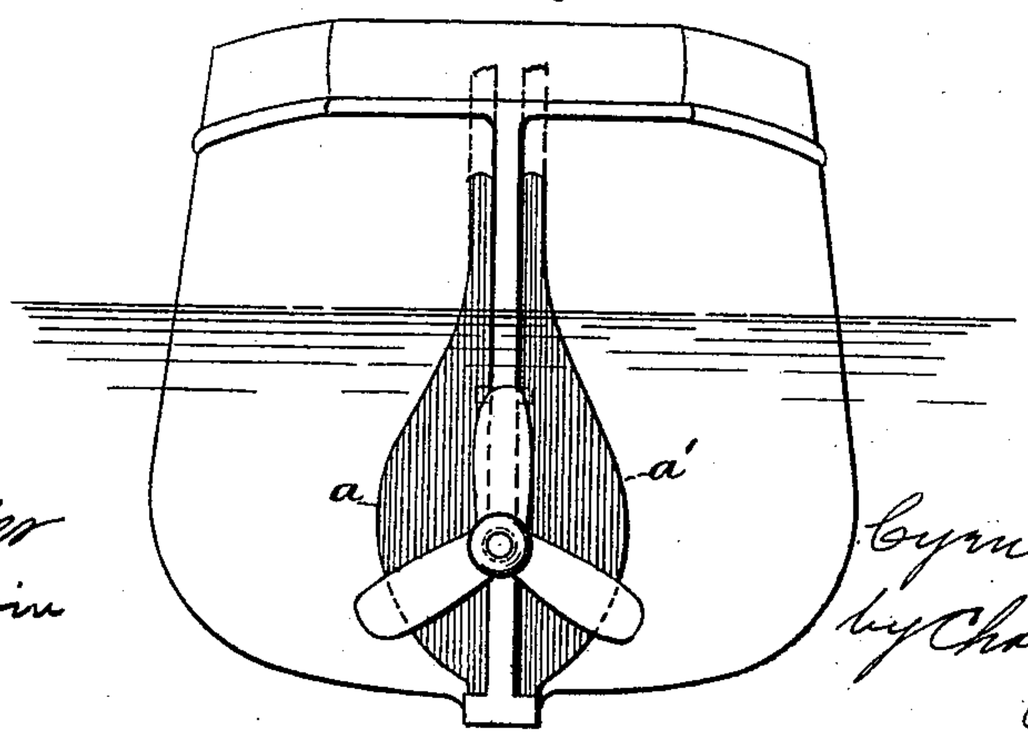


Fig. 4.



WITNESSES
John Becker
Jno. E. Davis

INVENTOR
Cyrus W. Field Jr.
by Chas. M. Higgins
Attorney.

UNITED STATES PATENT OFFICE.

CYRUS W. FIELD, JR., OF NEW YORK, N. Y.

SCREW-PROPELLED VESSEL.

SPECIFICATION forming part of Letters Patent No. 332,243, dated December 15, 1885.

Application filed April 20, 1885. Serial No. 162,861. (No model.)

To all whom it may concern:

Be it known that I, CYRUS W. FIELD, Jr., a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Screw-Propelled Vessels, of which the following is a specification.

The invention consists in an arrangement for extending or running out the propeller-shaft so that the screw can be operated in clear solid water aft of the rudder-post; and in order to properly describe my invention it has been necessary for me to illustrate and describe a peculiar form of rudder, which I believe to be new, and for which I am prepared to file an application for Letters Patent.

In the drawings which accompany and form a part of this specification, Figure 1 is a side view of the stern of a vessel with my invention applied thereto. Fig. 2 is a sectional plan view taken on line *x x*, Fig. 1. Fig. 3 is an end view of the mechanism employed to extend the main shaft, being taken on line *y y*, Fig. 2. Fig. 4 is a view of the stern of the vessel, showing both leaves of the rudder extended.

In order to carry out my invention, I employ a rudder which consists of two leaves, which are shown in the drawings at *a a'*. These leaves are hung in the ordinary manner by pintle and brace hinges; but instead of being secured aft of the rudder-post they are mounted in recesses formed in the dead-wood just forward of the rudder-post. The rudders are controlled by the ordinary steering-gear, which of course is duplicated on account of their being two rudder-heads. The mechanism, however, is not shown in the drawings, as it does not constitute part of my invention.

In operation it will be understood that so long as both leaves of the rudder are in the recesses formed for their reception the pressure on each will be equal, and the vessel will be in a state of equilibrium as far as any effect from the rudder is concerned; but if one of the leaves be turned out the pressure on that side will be increased, and the vessel will revolve around the center of gravity. The rudder, in fact, operates in precisely the same manner as the ordinary rudder, except that I employ two leaves, each of which describes an arc of ninety degrees, and together make up an arc of one hundred and eighty degrees, instead of using a single leaf that describes an arc of one hundred and eighty degrees. By this arrangement of the rudder the propeller-shaft can be extended directly through the rudder-post, and therefore support the screw in a position where it can operate in clear solid water, away from the soapy foamy water that is always found in the immediate wake of a vessel. The distance which the screw would advance in an unyielding substance during a single revolution is called the "pitch" of the screw, and the difference between the pitch and the actual advance made when the screw revolves in a yielding medium—such as water—is called the "slip." Now, it will be readily seen that the slip would be much less in what is called "solid" water than it would be in water filled with air-bubbles, as the former would be of greater specific gravity, and therefore offer a much greater resistance to the blades of the screw. Within reasonable limits the farther the screw is from the rudder-post the better the water for it to operate in, and in order to obtain the benefit arising from operating the screw in water of greater specific gravity I construct the main or screw shaft of my vessel so that it can be extended and retracted at will.

The mechanism employed for extending the shaft is seen in Figs. 2 and 3. A sleeve, as 1, is keyed to that section of the shaft which is in direct conjunction with the engine. This sleeve is provided with a feather, which rides in a groove formed along the forward end of the rear section of the shaft. The rear section of the shaft, which is shown in the drawings at 2, passes through one end of a sliding carriage, 3, and is held in its relative longitudinal position with said carriage by the collars 4 and 5. The carriage 3 is supported by a bearing-frame, 6, and slides in ways formed therein. Two pinions, 7 and 8, which mesh together, are mounted on the frame 6 in position to engage with the toothed racks 9 10, formed on either side of the carriage. A hand-wheel, 11, is secured to the shaft of one of the pinions 7 or 8, and by simply turning this wheel 11 the shaft 2 is extended or retracted. It would not be advisable to mount the screw so that it would be always at a considerable distance from the rudder-post, for it would then be liable to injury when the vessel was in port or tied up to the dock. I have therefore con-

structed the shaft, as described, so that it may be extended when the vessel is under way and returned to its normal position when the vessel is in port.

Fig. 1 is or may be assumed to represent the stern of an ordinary screw-propelled vessel, in which the space usually occupied by the screw between stern-post and rudder-post is utilized to form the recesses or pockets in which the leaves of the rudder described are placed, the shaft being extended through this space and through the rudder-post, and the screw placed entirely back of rudder and rudder-post, as illustrated.

I am aware that a rudder consisting of two leaves, one placed on each side of the dead-wood, is not new itself, as such is shown in Patent No. 232,651; and I am also aware that it is not new to mount a propeller on an extensible shaft adapted to be projected from and retracted toward the stern, as this is shown in Patent No. 20,862; but in that case the screw works in an aperture cut in the rudder and the rudder lies back of the screw, whereas in my case the extensible screw-shaft and screw are completely back of the rudder, by which means I secure a greatly-increased propelling effect from the screw without being impaired by the position of the rudder, whereas, on the other hand, the rudders are not affected by the action of the screw.

What I claim as my invention is—

1. In a screw-propeller, a screw mounted on an extensible shaft and arranged to operate in a position wholly back of the rudder, with a projecting and retracting device to project the shaft and screw back into clear water aft of the rudder and stern and to retract the same toward the stern as occasion requires, the said shaft and screw being capable of continuous revolution in either of said positions, substantially as and for the purpose set forth.

2. In a screw-propeller, the combination of a rudder composed of two rudder-leaves mounted in the dead-wood or narrow part of the stern, with a longitudinally extensible or movable screw-shaft passing out of the stern between said rudder-leaves, a screw mounted on the end of said shaft aft of the rudders, and a shaft projecting and retracting device for projecting the shaft into clear water aft of the stern and rudders and retracting the same toward the stern and rudders, substantially as herein shown and described.

CYRUS W. FIELD, JR.

Witnesses:
JNO. E. GAVIN,
EDWARD KENT, Jr.