No. 760,518. PATENTED MAY 24, 1904.

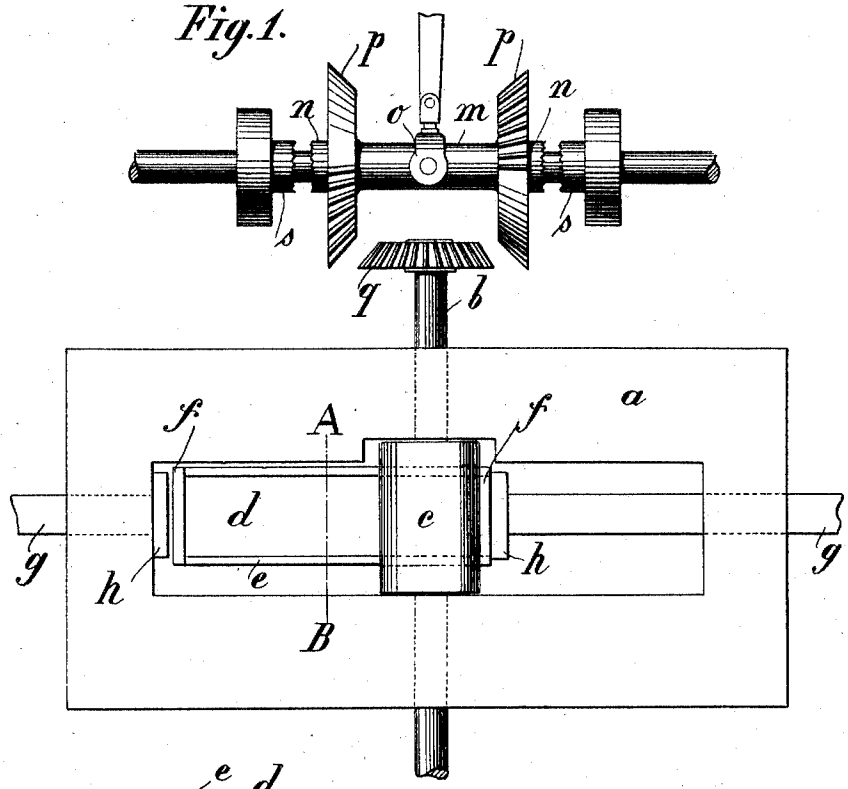
E. BOHN.

PROPELLING SHIPS.

APPLICATION FILED JUNE 30, 1903.

NO MODEL.

Fig. 1.



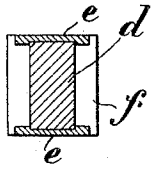
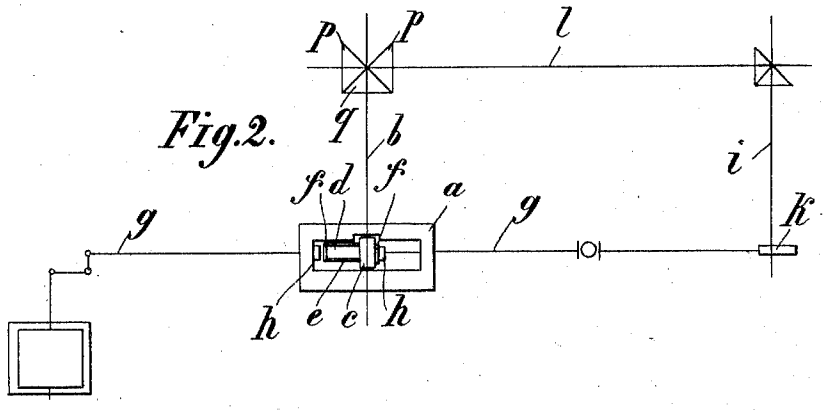


Fig. 3.

Fig. 2.



Witnesses
Waldo M. Chapin
Randall B. Humphrey.

Inventor
Ernst Bohn
by Wm. A. Rossbaum Atty

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 760,518. Patented May 24, 1904.

UNITED STATES PATENT OFFICE.

ERNST BOHN, OF BERLINCHEN, IN NEUMARK, GERMANY.

PROPELLING SHIPS.

SPECIFICATION forming part of Letters Patent No. 760,518, dated May 24, 1904.

Application filed June 30, 1903. Serial No. 163,677. (No model.)

To all whom it may concern:

Be it known that I, ERNST BOHN, residing at Villa Waldheim, Berlinchen, in Neumark, Germany, have invented certain new and useful Improvements in Propelling, Steering, and Controlling Ships, of which the following is a specification.

The floating or fin propellers hitherto employed for propelling ships have the drawback that they bear against the water with their full broadside both when making a non-propelling movement as well as when working, and thus produce not only a great resistance, but also greatly affect the forward movement of the ship.

This invention has for its object to remove this drawback, more particularly for submarine boats, in which, in consequence of the great resistance to the movement forward, an increased expenditure of power is necessary for steering and reversing the movement. This kind of ship's propeller should be successfully used. The peculiarity of this construction allows, in fact, of a uniform travel forward and backward without turning the vessel or any sudden stopping and when arranged obliquely allows of a rising of the submarine boat. The fin-propeller is also of great importance in ships on the surface of the water, where it is a question of rapidly checking the movement and rapidly reversing the movement without turning the ship.

The object of the invention is shown in the accompanying drawings.

Figure 1 is a side view of the mechanism; Fig. 2, a view, on a reduced scale, showing a diagrammatic arrangement of the driving; Fig. 3, a section of the ship's fin on the line A B of Fig. 1.

As may be seen from the drawings, a vertical shaft *b* projects from a casing *a*, which is open toward the water, and serves inside this casing as a guide or support *c* for the fin or propeller. The latter consists of a rectangular wood plate *d*, the longitudinal sides of which are stiffened by an iron frame *e*. On the ends of the plate strong support-bars *f* are applied, which at the end of each stroke retain the propeller in the slot of the guide *c*. The fin-guide is formed in such a way that the iron frame slides exactly in grooves, while the wood plate does not encounter the walls of the slot in order to avoid friction. Slide-bars *g* travel in stuffing-boxes on the vertical walls of the casing *a*, the outer ends of which slide-bars are each provided with a plate *h*.

The mode of working of this device is such that the shaft *b* so long as one of the retaining-bars *f* of the fin rests on the opening *c* makes a half-revolution, and thereby carries the fin with it, and then one of the two slide-bars *g* presses its end plate *h* against one of the retaining-bars *f*, and so pushes back the fin into the same position which it had before the commencement of the movement herein-before described. The movement continues again in the same manner. In traveling in the opposite direction the shaft moves in an inverse direction, whereupon the other slide-bar comes into action.

The machine may be driven in various ways. For instance, in the arrangement shown in Fig. 2 the slide-bar is moved by a machine-shaft *i* by means of an eccentric *k*, while the shaft *b* is operated by means of a double-bevel transfer-gear. In order to obtain an intermittent rotary movement, such as the arrangement of the present ship's propeller requires, half-couplings or clutch arrangements *s* are keyed on the horizontal shaft *l*, in which half-couplings the suitably-shaped ends *n* of a socket *m*, loosely mounted on the shaft and displaceable thereon, may engage according as the socket is to be coupled to the right or left by a lever arrangement *o*. Two bevel-wheels *p* are firmly connected with the socket *m*, only one-half of the periphery of which wheels is provided with teeth, which teeth are arranged opposite one another.

According to the adjustment one of the bevel-wheels *p* gears with a bevel-wheel *q*, toothed on its entire periphery, and thereby operates a rotation in one direction or the other.

As the bevel-wheels *p* are only toothed on half their peripheries, the shaft *b* always only makes a half-rotation and remains stationary so long as the teeth are out of engagement.

The left slide-bar of Fig. 2 may be operated either by means of multiple-bevel trans-

fer-gear and eccentrics through the same, drive-shaft *i*, or receives its movement through a separate electromotor or steam-cylinder, the low-pressure cylinder of the main engine being able to be employed therefor. The arrangement may also be such that on each side of the ship two fins are located in proximity to one another, so that when one has finished its half-revolution the other commences the same.

When the vessel, owing to one-sided loading, assumes such a position that the fins form an angle to the perpendicular, the device may be employed for raising submarine boats, using the upward-propelling force which then comes into action.

If the ship's fins are to be employed for rapidly stopping the vessel, they must be fixed in a position at right angles to the direction of travel. This is attained by the two slide-bars being brought so far forward at the moment in which the fin assumes this position that they press against the broad side of the guide *c*, and thus prevent any movement of the body of the fin. The reversal of the direction of rotation of the shaft *b* takes place by means of a lever arrangement *o*, which is connected by mechanical or electrical means with the arrangement for reversing the movement of the slide-bars *g*.

The fin-propeller hereinbefore described may also be employed in ships which are provided with screw-propellers when it is a question of obtaining a rapid alteration of direction and turning of the vessel.

What I claim, and desire to secure by Letters Patent of the United States, is—

A propeller consisting of the combination of an intermittently-rotating shaft provided with a transverse slot, a paddle located in said slot and means for sliding the paddle through the slot to change its radial position after each rotary movement of the shaft.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

ERNST BOHN.

Witnesses:
HUGO NELSON,
J. SIDON MERORY.