May 21, 1929. M. OERTZ 1,714,042

TWO-PART RUDDER FOR SHIPS

Filed Nov. 17, 1926

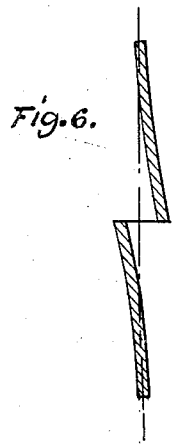


Fig. 6.

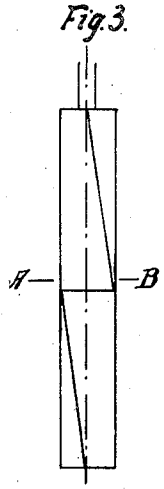


Fig. 3.

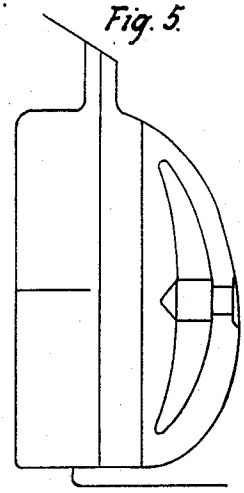


Fig. 5.

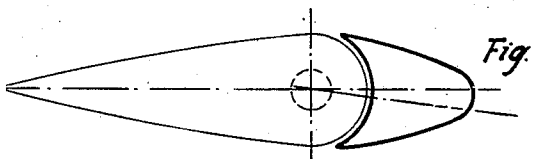


Fig. 1.

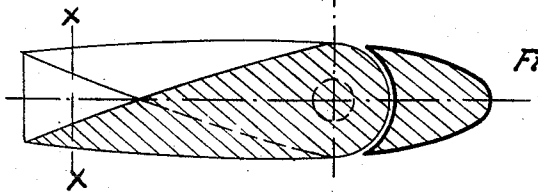


Fig. 4.

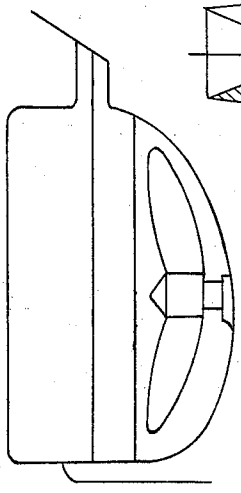


Fig. 2.

M. Oertz
inventor

By: Marks & Clark
Attys.

Patented May 21, 1929. 1,714,042

UNITED STATES PATENT OFFICE.

MAX OERTZ, OF HAMBURG, GERMANY.

TWO-PART RUDDER FOR SHIPS.

Application filed November 17, 1926, Serial No. 148,921, and in Germany April 15, 1926.

In a previous patent the present applicant has described an invention for a two-part rudder, which, being spaced away from the ship's hull, is of a cutwater form.

This apparatus is characterized by the feature that the oscillatable rear part of the rudder device is made longer than the front part, which is rigidly connected with the ship's hull, and that the cross-section of the oscillatable part at its broadest part is greater than the cross-section of the stationary front part at its broadest part, the two parts being pivoted to one another at about the position of greatest thickness, so that when the helm is deflected, a form resembling that of the supporting plane of an aeroplane is obtained.

The further developments of this invention form the subject-matter of the present application. All the constructional forms serve to improve the action of the steering gear.

It is known that the oblique column of water thrown by the screw, in single screw ships, always renders necessary a slight deflection of the rudder for the purpose of maintaining a course straight ahead. Efforts have also been made by means of guiding devices, such as guide blades and the like fitted to the post, to impart to the screw-water-stream a guidance in the direction of its rotation. Such blade-like devices are, however, very sensitive.

In contrast thereto the applicant arranges in the simplest manner a stationary guide body which constrains the stream of water to give up its twist or rotary direction of movement and flow towards the movable rudder body.

By the term "longitudinal ship's plane" is meant in this specification the plane intersecting the ship vertically in a longitudinal direction passing through the keel.

A further improvement in the construction may be obtained by making the entire device convex, as seen in a vertical section at right angles to the longitudinal ship's plane, that is to say, by shaping it with arcuate lateral boundaries.

Fig. 1 shows the cross section form that is characteristic of the Oertz-rudder.

Fig. 2 is a side elevation of the ordinary Oertz-rudder, the rear edge of the rudder extending as one continuous vertical line from the bottom to the top.

Fig. 3 shows a rear view of the rudder body, including the part of the post standing in front of it. It is recognizable therefrom that the outward edges of the two angularly displaced rudder elements of the movable rudder body have their maximum lateral convexity at about the centre of the rudder at the level of the propeller shaft and approach the longitudinal plane of the ship again towards the bottom and top.

Fig. 4 is a section at the position A—B according to Fig. 3.

It will be seen that according to the known form of the Oertz-rudder the cross-section character of the fixedly connected parts of the rudder remains from the bottom up to the top always the same, the cross section taken at various heights of the rudder body, however, does not remain symmetrical relative to the central line of the rudder-body but changes according to the form of the angularly displaced surfaces in its distance from the central line, namely in such a manner that at the level of the propeller shaft the maximum lateral convexity of the central line of the cross section of each of the two rudder elements lies above and beneath the propeller shaft whilst the central line of a cross section taken at the upper and lower end of the rudder body would correspond with the central line of the rudder body.

Fig. 5 shows a side elevation of the entire device. It will be seen therefrom that the stationary guide body has from the bottom up to the top always the same cross section character whilst the movable rudder body pivoted thereto, shows at the level of the propeller shaft a sectional line which lies somewhat beneath the section line A—B according to Fig. 3. The surface of the entire movable rudder body being not unitary and continuous but the part extending downwardly from the propeller shaft projecting and leaving the part extending upwardly from the propeller shaft behind, it is only possible to indicate a line in the side elevation of Fig. 5, the line representing one edge.

Fig. 6 is a section taken on line X—X according to Fig. 4 and it is clearly shown thereby in which manner the various surfaces above and below the elongated central line of the propeller shaft are extending.

A further improvement in single screw ships may now be employed on the rudder body, in such a way that the movable rudder body is not unitarily constructed but consists of two relatively displaced rudder elements, the rear edge of which exhibits the greatest

lateral convexity, approximately in the centre of the rudder at the level of the propeller shaft, and towards the top and bottom again approaches the longitudinal ship's plane.

The adapting of a rudder to the screw-water-stream by shaping it with twisted surfaces is already known. As contrasted with this formation, wherein it is not a question of a stationary, thick guiding body formed like a cutwater in front, the applicant displaces two cutwater rudder elements relatively to one another in combination with a stationary cutwater-shaped guide body in such a way as to obtain the best possible effect.

Fig. 5 shows the corresponding side elevation.

The present invention has the particular advantage of being capable of being readily fitted to ships that are already finished, since for the rudder post only a sheath is required, which is constructed in accordance with the fundamental idea of the present invention, and the back piece of the rudder may also be easily shaped or sheathed to cutwater form.

Any sheathing of the stationary rudder post in this manner already brings with it a thickening which would come under the protection of the patent, as it is obviously not a question of maintaining exact dimensions, but these may be different from one case to another according to the nature of the ship. In the case of a simple sheathing of the rudder post for the purpose of better distribution of the incident water, a considerable effect is already obtained, which the applicant has been the first to recognize.

The apparatus in all the methods of construction described, is obviously adapted not merely for lateral steering but also for depth steering in submarine vessels. For this kind of steering also the same is completely new in all methods of construction and can be particularly advantageously employed.

It is also obvious in the ideas of the present invention, to combine the features of the invention from one case to another for the best result or to employ them individually. Since each feature of each constructional form characterized in the individual claim is completely new in itself and is important for the attaining of a better action of the entire apparatus, the protection should expressly extend both to the use of the individual features by themselves according to the individual claim, and also to any desired combination of the individual features with one another.

What I claim is:

A two-part cutwater-shaped rudder for steering ships comprising a fixed rudder post, the thickness of which exceeds the usual thickness as given by the classification requirements, and an oscillatable rear part, said rear part being pivoted to said fixed rudder post at substantially the maximum thickness of their cross sections and the cross section of the rudder at its broadest part being greater than the section of the rudder post at its broadest part, and said oscillatable rear part consisting of two rudder elements which are arranged at an angle to one another on the common pivotal axis and having their rear edges diverging in opposite directions from the central longitudinal plane of the ship, the maximum divergence occurring at the level of the propeller shaft.

In testimony whereof I affix my signature.

MAX OERTZ.