

J. B. DUNLOP.
STEERING GEAR.
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1,046,158.

Patented Dec. 3, 1912

Fig. 1.

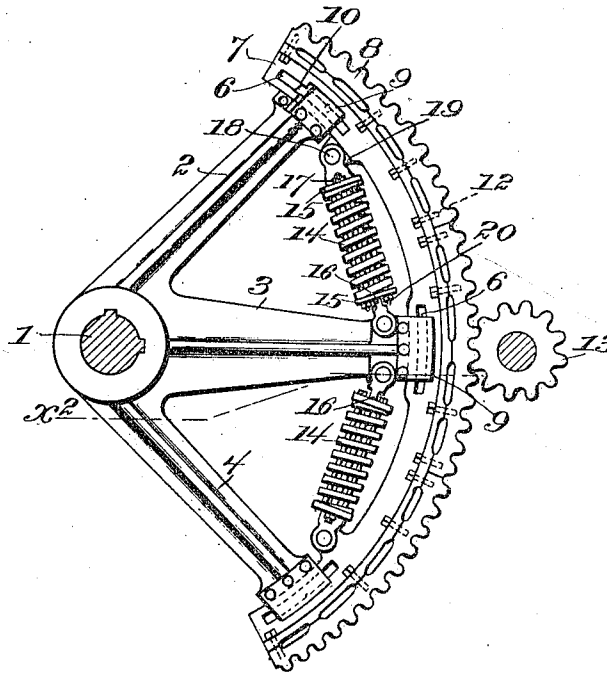
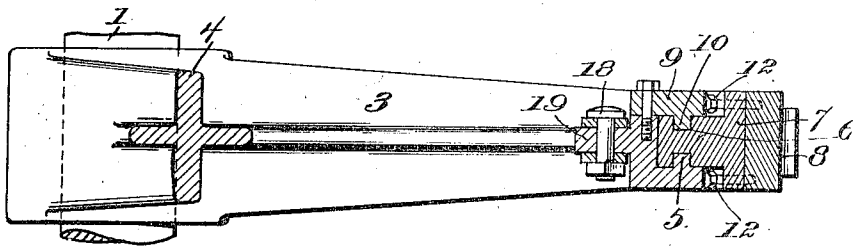


Fig. 2.



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UNITED STATES PATENT OFFICE.

JAMES B. DUNLOP, OF EVERETT, MASSACHUSETTS.

STEERING-GEAR.

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To all whom it may concern:

Be it known that I, JAMES B. DUNLOP, a citizen of the United States, residing in Everett, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Steering-Gears, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to a steering gear for ships, and is embodied in a cushioning device for taking up the shocks due to the action of a heavy seaway on the rudder.

The invention is shown as embodied in the usual form of steering gear, in which a toothed segment is connected with a radial tiller member extending from the rudder post, so that the rudder may be turned by the action of a spur-gear, power driven or hand operated, as the case may be, intermeshing with said toothed segment.

In the construction shown to illustrate the invention, the radial tiller-member consists of a spider, and the segmental gear is directly connected with the spider, and rigidly connected, so far as relates to any radial movement with relation to the axis of the steering post, but yieldingly connected so far as relates to a movement around the axis of the steering post.

In the construction shown, the spider on which the segment is mounted has three arms, each of which is provided with engaging tongues which are adapted to enter sockets in the sides of the segment. The tongues at opposite sides are separable for the purpose of assembling the device and are adapted to be fastened together after insertion in the segment sockets. By this construction, the spider and segment are solidly held together, so far as relates to any displacement of one part with relation to the other in a direction radial to the axis of the rudder post, but the segment is free to turn around the axis of the rudder post to an extent which is limited only by the ends of the sockets in which the tongues are held. To hold the segment normally centered, it is connected with the spider by means of springs which are strong enough to transmit the normal steering strain without undue lost motion, but which will yield and cushion the shocks due to the impact of the water when the weather is rough.

Figure 1 is a top plan view of a steering segment constructed in accordance with the invention, and Fig. 2 is a vertical section on line x^2 of Fig. 1, drawn to a larger scale.

Referring to Fig. 1, the rudder post 1 is provided with a spider having three arms, 2, 3 and 4, each of which is shown as provided at its outer end with a laterally projecting tongue 5, adapted to enter a corresponding socket 6 in a segment member 7 which carries a segmental gear 8. The said segment member 7 is provided with corresponding sockets at both sides, as clearly shown in Fig. 2, and each of the spider arms is provided with a detachable clamping member 9, provided with a tongue 10, which corresponds with the tongue 5, at the opposite side.

In the construction shown, the gear teeth 8 are formed in separate sections and adapted to be secured to the segment 7 by means of bolts 12, so that they are readily removable, if worn. The channels in the segment member 7 are made longer than the tongues on the spider arms, as shown in Fig. 1, so that when the said segment is clamped in position with the tongues in the sockets, the segment is held solid with relation to the rudder post 1, so far as relates to radial movement, but is free to move around the axis of the rudder post, to an extent which is limited by the length of the sockets. In order to hold the segment and post together, so that the post will be turned when the segment is moved, as by the pinion 13, the said segment is connected with the spider by means of heavy springs 14, the said springs each being shown as connected at one end with the middle arm of the spider and at the opposite end with a portion of the segment 7.

As herein shown, the springs are interposed between adjustable plates 15 at opposite ends, there being a single rod 16, pivotally connected with the middle spider arm, which projects through an opening in the plate 15 at the opposite end of the spring, and is provided with an adjusting nut 17. The connection at the opposite end of the spring is made by means of a forked member pivoted on a bolt 18, passing through a lug 19 on the segment, the opposite end of said member extending through the spring and being secured by adjusting nuts 20.

By the construction above described, the

spider and segment are firmly held together; and the springs are sufficiently strong to cause the movement of the steering mechanism to be transmitted to the rudder without any material lost motion, while shocks, due to the action of a heavy sea on the rudder are cushioned by the springs to an extent sufficient to protect the gear teeth from being broken, or rapidly worn. Furthermore, all the wearing parts are readily removable and replaceable; and in the case of a broken spring, it is a simple matter to lock the segment fast to the spider so that it will be in perfect operative condition, although deprived of the cushioning effect.

What I claim is:

1. The combination with a rudder post provided with a spider; of a gear segment having separate tongue and socket connections with each arm of the spider; and springs connected with said spider near the middle thereof, and with said segment near the ends thereof.

2. The combination with a rudder post provided with a spider, the arms of which have inwardly projecting tongues; of a geared segment having grooves at opposite sides; detachable tongue members adapted

to be secured to the spider arms to cooperate with the permanent tongues in holding the segment in place; and springs connecting said spider with said segment to admit of an independent movement of one part relative to the other around the axis of the rudder-post.

3. In a steering gear, the combination with a rudder post provided with a spider having a plurality of spider arms; of a segment mounted on and supported by said spider arms; separate connecting devices connecting the spider arms respectively with said segment to prevent radial movement and admit of a limited circumferential movement thereof relative to the axis of the rudder post; and external springs connecting said segment at opposite sides of the middle thereof, with said spider at a point between the ends of the said segment.

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

JAMES B. DUNLOP.

Witnesses:

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JAS. J. MALONEY.