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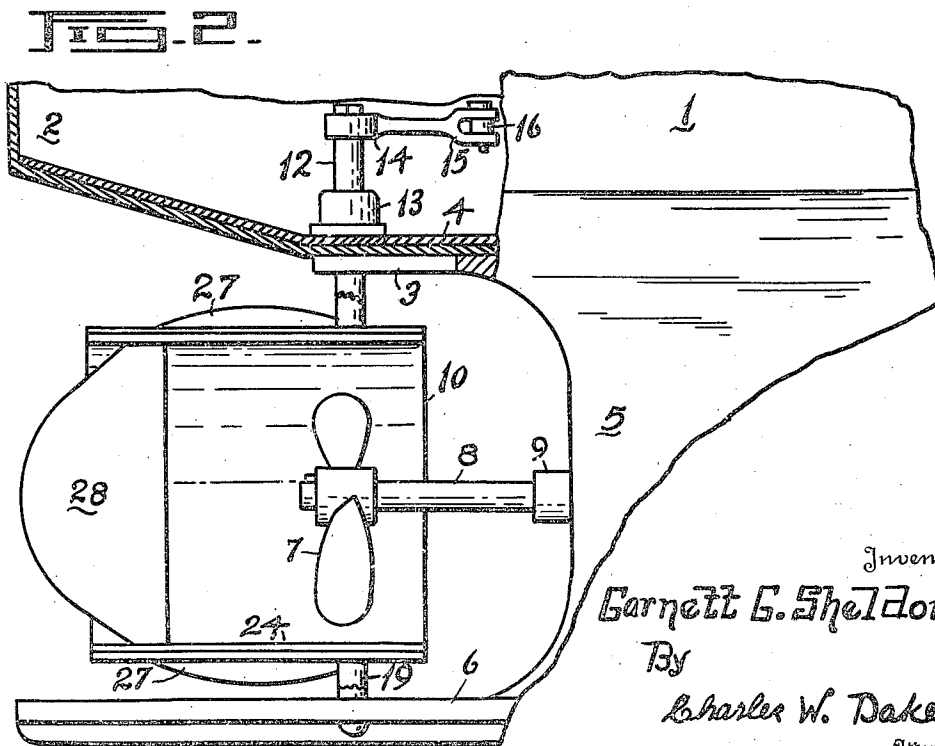
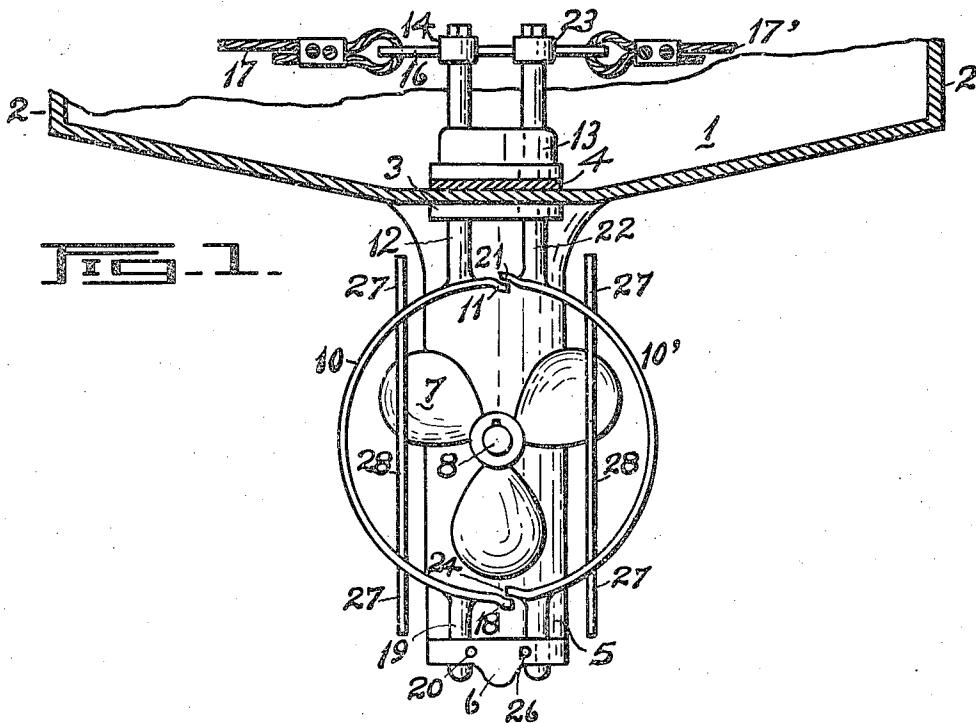
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2,483,675

JET FLOW RUDDER

Filed June 21, 1946

2 Sheets-Sheet 1



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FIG. 3.

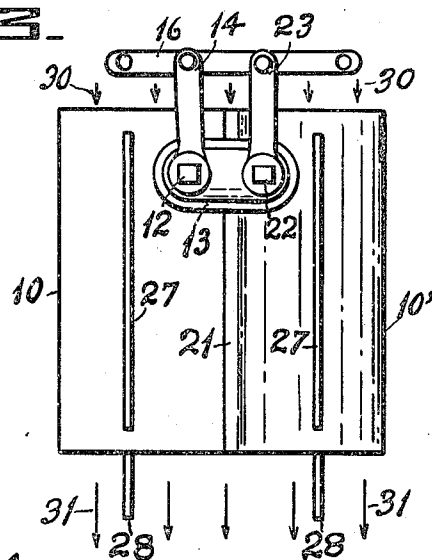
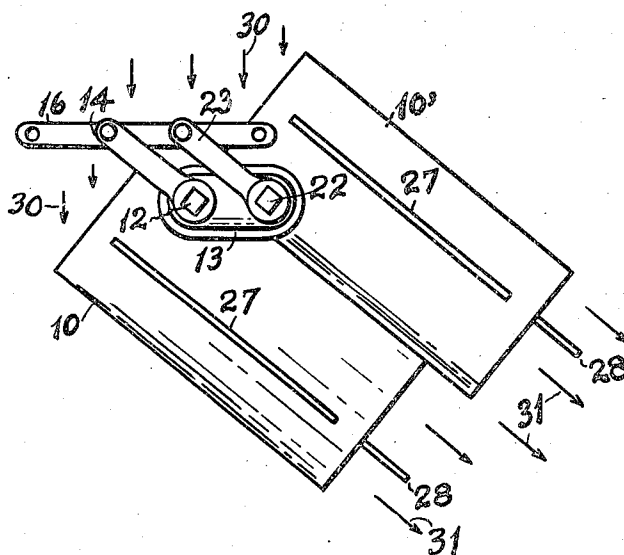


FIG. 4.



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2,483,675

JET FLOW RUDDER

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Application June 21, 1946, Serial No. 678,252

6 Claims. (Cl. 114—166)

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My present invention relates to improvements in jet flow rudders in which a propeller in conjunction with a pair of oppositely concave concavo-convex plate members for steering marine craft such as power driven boats and herein-after referred to as power driven boats; and the objects of improvement are: First, to provide a jet flow rudder for power driven boats that will have greater steering efficiency than rudders heretofore employed; second, to provide a jet flow rudder for power driven boats that protect the propeller against damage by snags, drift wood, ice and other totally or partly emerged solids; third, to provide a jet flow rudder for power driven boats that will turn the craft in a smaller radius than the blade rudders usually employed for turning marine craft; fourth, to provide a rudder for power driven boats that will minimize turbulence in the water in which the craft is being propelled; fifth, to provide a rudder for power driven boats that will protect the propeller of power driven marine craft; sixth, to provide a jet flow rudder for power driven boats that will project the flow of water at an angle to the course of the marine craft; seventh, to provide a jet flow rudder for power driven boats that will be substantially free from disorder; eighth, to provide a jet flow rudder for power driven boats that will minimize the rotatable whirl of the water passing through the rudder; ninth, to provide a jet flow rudder for power driven boats that will be easily understood; tenth, to provide a jet flow rudder that can be applied to marine craft of substantially all types.

I attain the afore named objects and such other objects as appear by the structure illustrated in the accompanying drawing, in which—

Figure 1 is a cross-sectional view of the after portion of power driven boat of the yacht type equipped with my present jet flow rudder.

Figure 2, an elevation part sectional view of the power driven boat equipped with my jet flow rudder.

Figure 3, a top plan view of the jet flow rudder removed from the boat and with the mechanism in straight ahead steering of a power driven boat.

Figure 4, a top plan view of the jet flow rudder removed from the boat and with its mechanism in turning of the power driven boat.

Throughout the several views of the said drawing, similar numerals refer to similar parts and portions of a jet flow rudder and boat to which the rudder is associated, and referring thereto:

Numeral 1 refers to the boat which, as shown, is of the yacht type having a slight V under form transom, 2 the sides of the boat which has a keel 3 and keel-son 4 with skeg 5 extending downward from the keel and rudder supporting shoe

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6 secured to the bottom of the skeg. Numeral 7 refers to the propeller for driving the boat and which is mounted on a propeller shaft 8 near its free end which is farthest from the skeg 5 supporting stern bearing 9 of the propeller shaft.

The rudder and its operating mechanism consists of port side concavo-convex water deflecting plate 10 having at its top edge inwardly turned longitudinally extending flange 11 and adjacent the said flange 11, a rudder turning post 12 extending upward through the keel 3, keel-son 4 and a rudder post bearing housing 13 with a rudder turning arm 14 fastened thereto at its upper end; the rudder turning arm has swingable attached thereto at its swingable end 15 a link 16 from which extends a cable 17 toward and along the port side of the boat with the purpose of steering the boat from the said port side. The concavo-convex plate 10 has at its lower edge outwardly turned longitudinally extending flange 18 and adjacent the said flange 18, rudder swivel post 19 extending into and through the rudder supporting shoe 6 with pin 20 engaging the post in an annular groove extending around the post within the rudder supporting shoe 6. Numeral 10' refers to a second or starboard side concavo-convex water deflecting plate which is similar to the port side concavo-convex water deflecting plate 10 and differing therefrom only in that at its upper edge it has outwardly turned longitudinally extending flange 21 and adjacent the said flange 21 rudder turning post 22 extending upward through the aforesaid keel 3, keel-son 4 and rudder post bearing housing 13 with rudder turning arm 23 fastened thereto with the aforesaid link 16 swingable attached thereto and having cable 17' extending therefrom towards the starboard side of the boat and along said starboard side towards the front or prow of the boat and where the cables 17 and 17' may unite and form a continuous cable by which to steer the boat.

The concavo-convex water deflecting plate 10' has at its lower edge an inwardly turned longitudinally extending flange 24 and adjacent the said flange, rudder swivel post 25 extending into and through the rudder supporting shoe 6 with pin 26 engaging the post in an annular groove extending around the post within the rudder supporting shoe 6.

Extending longitudinally of each concavo-convex water deflecting plate 10 and 10' at their periphery are fin like members 27 against a side of which the water impinges as the boat moves either forward or backward thereby assisting steering of the boat, also at the inner concave sides of the concavo-convex water deflecting plates 10 and 10' and extending from the ends of the plates are water training plates 28 whereby

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the water forced by the propeller 7 through the cylindrical opening between the concavo-convex plates is trained to the direction the rudder is turned to.

Arrows 30 designate the flow of water drawn into the cylindrical space between the concavo-convex plates 10 and 10' by the propeller 7 and through which space the water flows in the direction the rudder is turned and from which space the water is projected in a cylindrical column or jet in the direction indicated by arrows 31 which as shown in Figure 3 as directly aft of the boat and in Figure 4 as directed towards the starboard side of the boat for turning the boat to starboard. The fin like members 27 assisting in turning the boat as also the training plates 28 which prevent the column or jet of water flowing from the rudder to be trained directly aft of the boat.

In the operation of the present jet flow rudder when applied to a power driven boat having a propeller mounted as shown in the drawing and rotated in the direction of its screw pitch by motive power, when steering straight forward, the rudder is set to the position shown in Figures 1, 2 and 3 by the link 16 and arms 14 and 23 attached to the rudder posts 12 and 22, and when it is desired to turn or swing the boat to port, or to starboard as shown in Figure 4, the rudder is turned by said link 16, arms 14 and 23, as shown in Figure 4, in which position the water flowing through the rudder will be deflected to starboard of the boat and flow from the rudder in the direction indicated by arrows 31 shown in Figure 4 and thereby with the assistance of the fin like members, turn or swing the boat to starboard. When it is desired to turn or swing the boat to port, the link 16 and arms 14 and 23 are swung towards the starboard side of the boat which will swing the concavo-convex plates towards the port side of the boat and the boat will be turned to port, the said turning may be accomplished by the cable 17 adapted to extend in a loop within the boat. The present jet flow rudder is equally adapted for backing of the boat in which the rudder is turned to the opposite angle than that shown in Figure 4.

Having described and illustrated my present invention, the rights thereto I desire to obtain by Letters Patent are:

1. In a rudder of the class described, the combination with a power driven boat having a skeg with a rudder shoe fastened to its under side and extending therefrom and a propeller shaft extending from the skeg with a screw propeller mounted on the shaft: a pair of concavo-convex elongated plates in spaced apart relation with their concave side facing each other and a turned flange extending longitudinally of each plate and extending over the edge of the adjacent plate and fin like members extending longitudinally of the plate at its periphery and a water training plate within to concave of the plate and extending therefrom away from the propeller and each plate having a swivel post engaging the rudder shoe and a rudder post extending upward with a steering arm fastened to the rudder post and having a link turnably connected to each steering arm and adapted to have connected thereto a cable for swinging the said arms in substantially parallel relation to each other.

2. In a rudder of the class described, the combination with a power driven boat having a skeg with a rudder shoe fastened to its under side and extending therefrom and a propeller shaft extending from the skeg with a screw propeller mounted on the shaft: a pair of concavo-convex

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elongated plates in spaced apart relation with their concave side facing each other and a water training plate within to concave of the plate and extending therefrom away from the propeller and each plate having a rudder post extending upward with a steering arm fastened to the rudder post and having a link turnably connected to each steering arm and adapted to swing the said arms in substantially parallel relation to each other.

3. In a rudder of the class described, the combination with a power driven boat having a skeg with a rudder shoe fastened to its under side and extending therefrom and a propeller shaft extending from the skeg with a screw propeller mounted on the shaft: a pair of concavo-convex elongated plates in spaced apart relation with their concave side facing each other and a turned flange extending longitudinally of each plate and extending over the edge of the adjacent plate each having a swivel post engaging the rudder shoe and a rudder post extending upward with a steering arm fastened to the rudder post and having a link turnably connected to each steering arm and adapted to have connected thereto a cable for swinging the said arms in substantially parallel relation to each other.

4. In a rudder of the class described, the combination with a power driven boat having a skeg with a propeller shaft extending from the skeg with a screw propeller mounted on the shaft: a pair of concavo-convex elongated plates in spaced apart relation with their concave side facing each other and a rudder post extending upward from each of the plates with a steering arm fastened to each rudder post and having a link turnably connected to the steering arm of each rudder post and adapted to have connected thereto a cable for swinging the said arms in substantially parallel relation to each other.

5. In a power driven boat having a rearwardly directed propeller, the combination of, a pair of concavo-convex plates in spaced apart relation facing each other each having an offset flange overlapping each other at adjacent edges of the plates, a water training plate secured within the concave of each plate extending axially thereof, each plate attached near its forward end on a vertically pivoted post and means for rotating each post simultaneously in the same direction.

6. In a power driven boat having a rearwardly directed propeller, the combination of, a pair of concavo-convex plates in spaced apart relation facing each other, normally located axially of the propeller, each plate having an offset flange, the flanges overlapping each other at adjacent edges of the plates, a water training plate secured within the concave of each plate extending axially thereof, fin-like members extending vertically outwardly and axially of each plate, each plate mounted near its forward end on a vertical pivot and means for rotating the plate simultaneously in the same direction.

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