

Nov. 16, 1937.

L. POSSENHEIM

2,099,229

FIN EQUIPPED RUDDER

Filed Jan. 15, 1936

2 Sheets-Sheet 1

Fig. 1

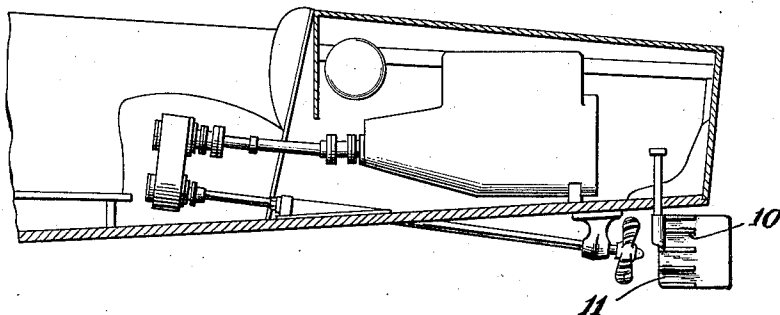


Fig. 2

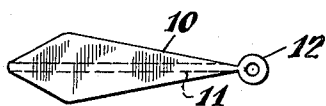


Fig. 3

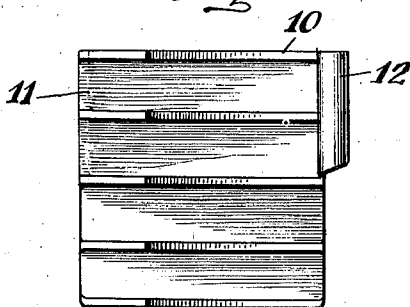


Fig. 5

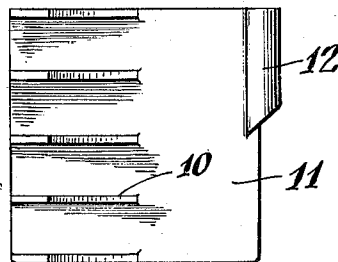


Fig. 4

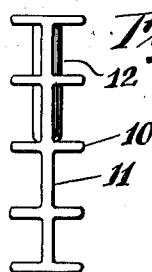


Fig. 6

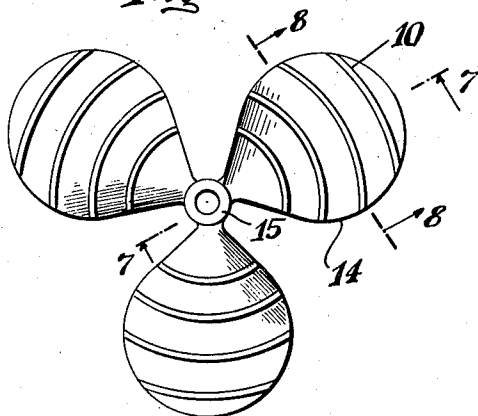


Fig. 7

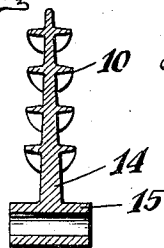
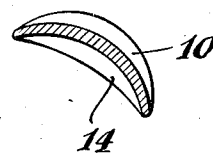


Fig. 8



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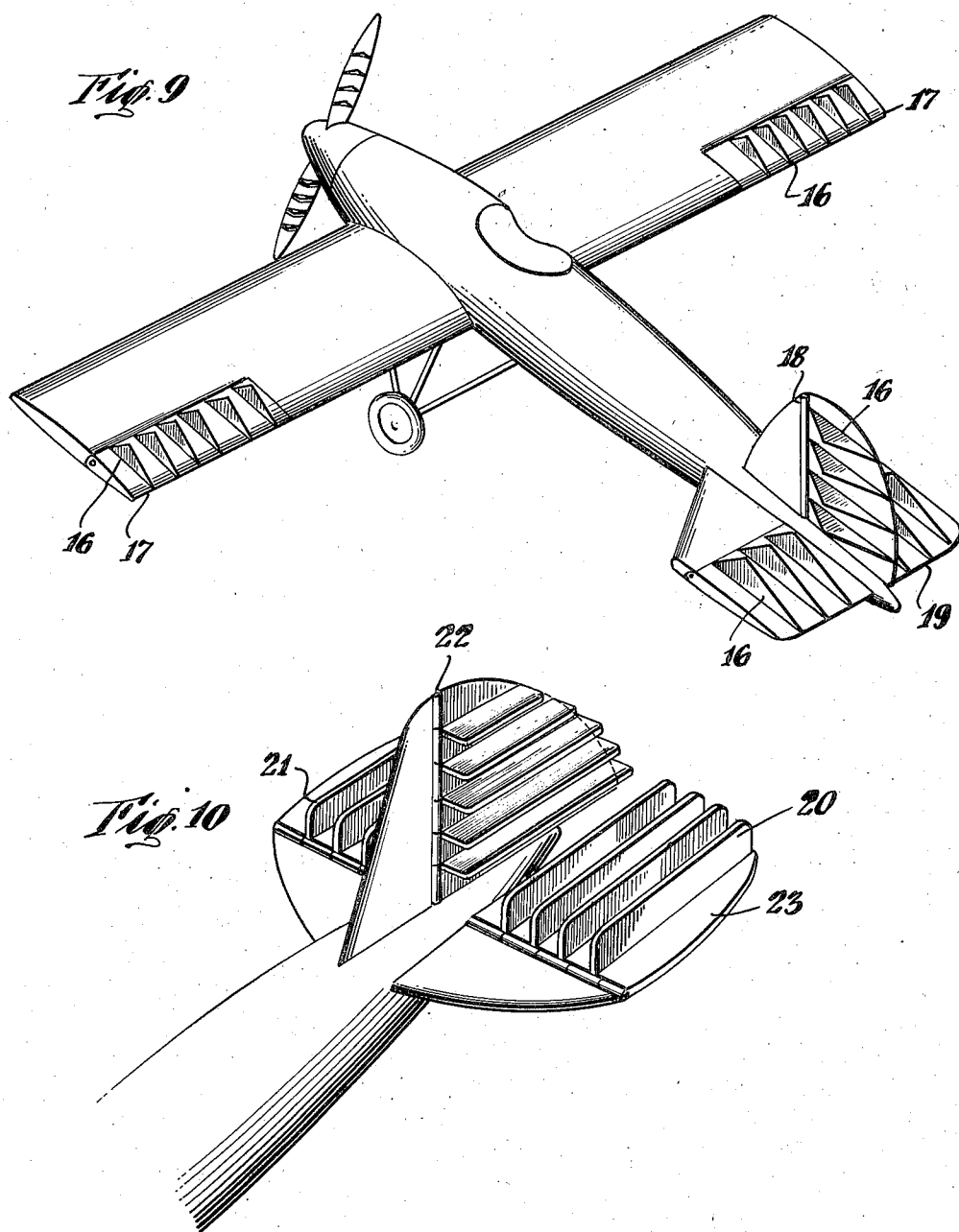
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2 Sheets-Sheet 2



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2,099,229

FIN EQUIPPED RUDDER

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Application January 15, 1936, Serial No. 59,184

1 Claim. (Cl. 114—162)

My invention relates to improvements in rudders and propellers, particularly for ships and other floating vessels and on airplanes and other aircraft, and it is the principal object of my invention to provide a rudder which will enable ships or aircraft equipped therewith to make quicker and sharper turns than it is possible to make with the customary rudders, as the rudder according to my invention responds faster and more effectively than any other rudder, and will help to steer the boat on a straighter course.

Thus, my improved rudder will for instance cut down the distance between America and Europe by the steering of a straighter course and ships will arrive in a much shorter time, thus saving not only time but also money in the form of using less fuel or power, by discharging the passengers sooner, a great saving in money otherwise expended for food etc. will be accomplished, and the income of the steamship companies will considerably be increased by making the voyage safer and faster.

Another object of my invention is the provision of a rudder which responds instantaneously and positively, and thus will contribute to the prevention of accidents by collisions with other vessels, icebergs and piers which are almost daily occurrences resulting in loss of lives and equipment.

Other benefactors achieved by the equipment of naval craft with my rudder will be the saving of lives of many a brave sailor and contribute to the conservation of battleships etc. in times of war, as my rudder is particularly well adapted for use with warcraft as it enables them to steer out of the danger zones quicker than ships equipped with other rudders.

A further object of my invention is the provision of a rudder which is well adapted for the replacement of the rudders now in general use, as they do not need to be discarded altogether, but simply improved by attaching my invention which is inexpensive and simple to manufacture.

A still further object of my invention is the provision of a rudder equipped with fins attached to the sides of the rudder parallel to one another and parallel to the flow of the water, and while these fins may have any suitable shape, actual tests made with my improved rudder have shown that substantially triangularly shaped fins are the most effective ones. Such fins or walls may be attached to any part of the sides of the rudder or between any two points on the sides of the rudder, but preferably between the middle and the free end of the rudder blade.

These fins are preferably substantially V-shaped at their outer edges yet very strong and while they offer little resistance when the rudder is not in operation, they admit during steering a large body of water between their walls which will strike the side of the rudder in a condensed form creating a stronger pushing force than any other rudder, while at the same time a suction is produced between the fins on the opposite side of the rudder which immediately pulls the vessel in the desired direction.

Therefore my improved rudder will give a double immediate action in the form of a stronger push and greater suction or pull on opposite sides of the rudder.

According to my invention the fins may be attached separately to the rudders at present in use, or they may be readily built in with rudders and may be of any desired and suitable size and shape, metal or other material. The channels between the fins may be called waterchannels on water vessels and airchannels on aircraft rudders and in this instance will act somewhat in the manner of stabilizers to the craft.

Another advantage obtained by the use of my improved rudder resides in the fact that during steering operation the fins will prevent the water which ordinarily splashes up and down after striking the rudder from escaping as fast as with rudders of the customary type, while at the other side of the rudder the fins will prevent the water from dropping down and shooting up along the side of the rudder and thus creating with my rudder a strong suction greatly assisting in the successful operation of the rudder and its steering power, and inasmuch as these operations of the rudder will act as a brake, boats equipped with my fin fitted rudder can stop much faster and much more readily when the rudder is properly operated.

These and other objects and advantages of my invention will become more fully known as the description thereof proceeds, and will then be more specifically defined in the appended claim.

In the accompanying drawings forming a material part of this invention:

Fig. 1 is a fragmentary, sectional side elevation of a vessel equipped with a rudder constructed according to my invention.

Fig. 2 is an elevation of one of the fins, a double fin.

Fig. 3 is a side elevation of a rudder equipped with fins extending over the entire face of the rudder on a somewhat enlarged scale.

Fig. 4 is a rear end view thereof.

Fig. 5 shows a rudder with fins extending over part of the rudder.

Fig. 6 shows a propeller equipped with fins according to my invention.

5 Fig. 7 is a section on line 7—7 of Figure 6.

Fig. 8 is a section on line 8—8 of Figure 6.

Fig. 9 is the perspective view of an airplane equipped with ailerons and rudders fitted with fins constructed according to my invention, and with
10 a fin equipped propeller.

Fig. 10 is a fragmentary perspective view of the tail of an aeroplane the rudders of which are equipped with a modified form of fins.

As illustrated, the fins 10, constructed according to my invention are substantially flat and rhomboidal-shaped, and are either attached to the top and bottom of a rudder 11, or their halves supplementing one another to a whole fin, Fig. 2, are secured to both sides of the rudder, as for
20 instance shown in Figure 3, where they extend from the rudder post 12 towards the outer end of the rudder, with their acute angles at the free end of the rudder, while their obtuse angles are located at both sides of the rudder.

25 As shown in Figure 5, these fins may extend instead of over the entire width of the rudder, as shown in Figure 3, from the middle of the rudder to its outer end edge only.

In Figures 6, 7 and 8, I have shown the application of the fins to a propeller 14 and in this instance they are curved on the arc of a circle corresponding to the curvature of the propeller hub 15.
30

As shown in Figure 9, the fins 16 are attached to both sides of the ailerons 17 in parallel, spaced relation to each other and to the direction of the flow of the air, and to both sides of the direction rudder 18, and of the ascending and descending rudder 19.
35

As shown in Figure 10, the fins 20 are not substantially triangularly-shaped but are formed into flaps or flat plates, eventually having their front and rear edges rounded, as at 21, and attached to both sides of the direction rudder 22 and of the ascending and descending rudder 23
40 of the usual well known types.

The use and operation of my rudder will be entirely clear from the above description by simultaneous reference to the drawings, and it will
45 be clear that the substantially triangularly shaped fins are arranged parallel to the direction of flow

of the water on watercraft and of the air of aircraft, and parallel to one another, and as they are very thin, but nevertheless strong, and V-shaped at their outer edges, they will practically offer no resistance, they are arranged on top and bottom as well as to both side faces of the rudder between top and bottom fins and are either extending over the entire width of the rudder and over one half thereof only, or over any part thereof.
5 10

If the rudder has a 90° angle extending forward from its rear upper and lower edges, as in Figure 1, the upper and lower fins may be built in one piece and attached to the upper and lower edges of the rudder, while the fins in between
15 are built separately and are arranged on each side of the rudder. While the slope of the fins and their attachment and the number of fins may be varied according to conditions prevailing, actual tests have shown that a rudder with four
20 sets of fins, one on top and one at the bottom of the rudder and two between gives a largely increased efficiency.

All statements made above with respect to the fins attached to the rudders of water vessels, are also true with respect to the fins attached to the rudders and ailerons of aeroplanes and other aircraft, whereby naturally the air takes the place of the water. The channels formed by my fins on propellers for water—as well as aircraft, will
30 increase the driving force of the propeller considerably.

It will be understood that I have described and shown the preferred forms of my invention as a few examples only of the many possible ways to
35 practically construct the same, and that I may make such changes in its general arrangement, and in the construction of its minor details as come within the scope of the appended claim without departure from the spirit of my invention
40 and the principles involved.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

In a ship, a rudder, substantially flat, rhomboidal-shaped fins on top and bottom edges and fins to both sides of the rudder arranged in halves on opposite sides of the rudder, supplementing one another to a whole fin, extending from the centre rearward.
45 50

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