July 1, 1924. 1,499,900

G. F. ZUCKER

MEANS FOR STEADYING SHIPS

Filed March 21, 1922

Fig. 1.

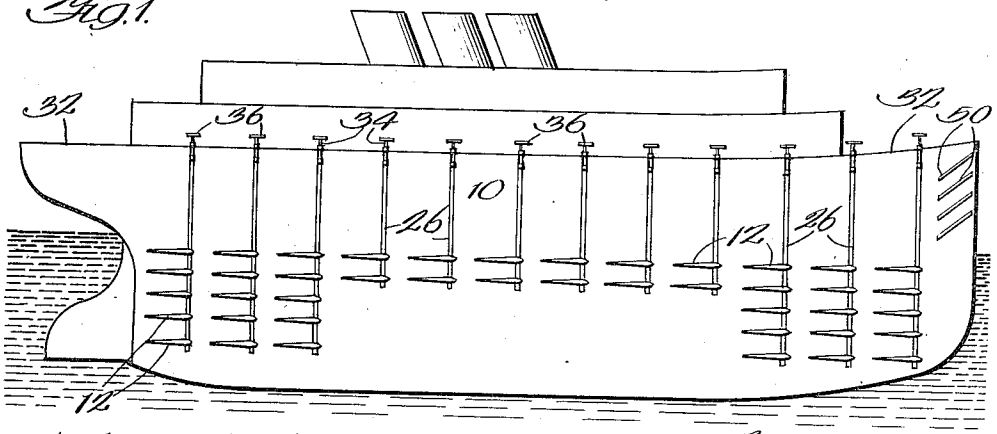


Fig. 2.

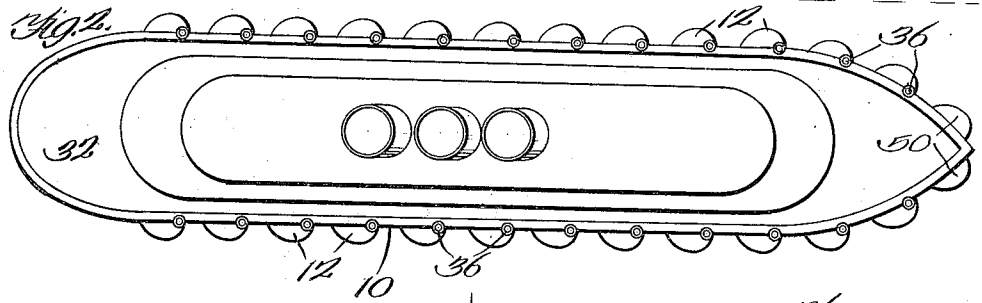


Fig. 3.

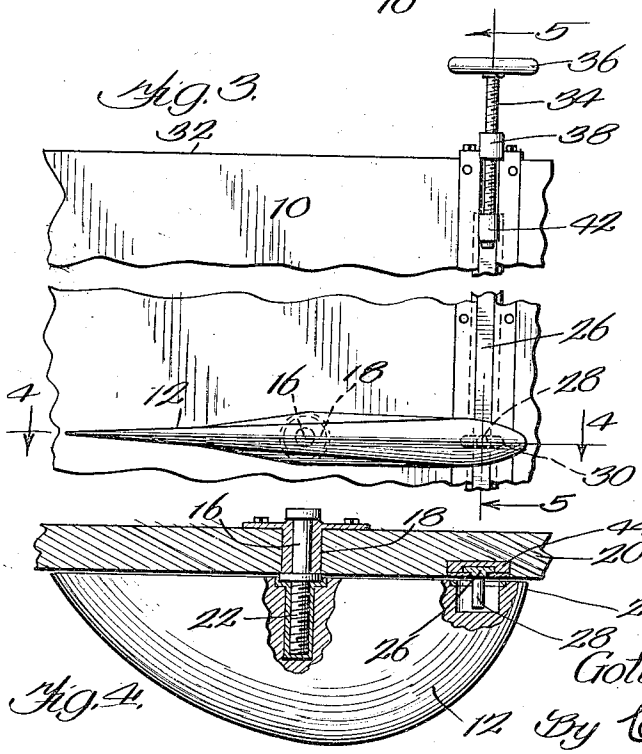


Fig. 5.

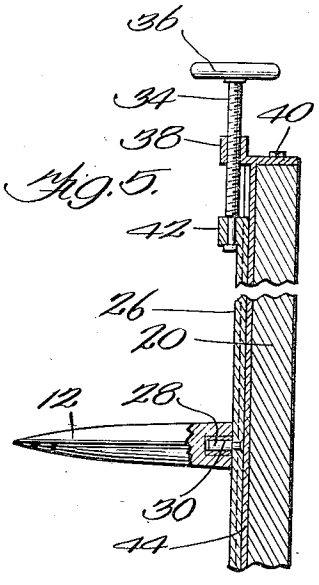


Fig. 4.

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UNITED STATES PATENT OFFICE.

GOTTLIEB F. ZUCKER, OF CHICAGO, ILLINOIS.

MEANS FOR STEADYING SHIPS.

Application filed March 21, 1922. Serial No. 545,398.

To all whom it may concern:

Be it known that I, GOTTLIEB F. ZUCKER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Means for Steadying Ships, of which the following is a specification.

This invention relates to ships of considerable size traveling through large bodies of water where the waves run high enough to make it unpleasant for passengers and other occupants of the ship.

The object of this invention is to provide mechanism which will materially reduce the rolling of the ship as it moves through rough water.

The invention consists in providing the sides of the ship with horizontally disposed laterally projecting blades or fins which do not seriously retard the progress of the ship forward or backward, but do impose a serious resistance to rolling action. The invention further consists in means for angularly adjusting these blades to a horizontal plane whereby they assist in causing the ship to tend to ride upward in the water or to more or less submerge in the water. The invention also consists in many features and details of construction which will be hereafter more fully set forth in the specification and claims.

Referring to the drawings in which like numerals designate the same parts throughout the several views—

Figure 1 is a side elevation of a ship equipped with the device of this invention, the ship being, for purposes of illustration, very much shorter in length than it would normally appear;

Figure 2 is a plan view of the device of Figure 1;

Figure 3 is an enlarged detail side view of one of the fins or blades on the side of the ship, showing the mechanism for changing its angularity;

Figure 4 is a plan view on the line 4—4 of Figure 3; and

Figure 5 is a vertical sectional view on the line 5—5 of Figure 3.

The invention is applicable to any size or style of ship 10, the only difference being as to the number of vertically disposed groups of fins placed along the side of the ship.

Each group of fins referred to in the last sentence comprises a plurality of vertically disposed blades or fins 12, all alike in construction, vertically spaced apart at suitable intervals, as indicated in Figure 1. Each individual fin is journaled at a suitable point intermediate its length, usually at its middle, on some form of suitable horizontal axis, in the particular case illustrated, this axis including a bolt 14 having a journal bearing 16 rotatable in a block 18 let into a side member 20 constituting a part of the side wall of the ship. The opposite end portion 22 of the bolt 14 is screw threaded into the fin 12, as shown in Figure 4, whereby when the bearing member 16 rocks in member 18, the fin is correspondingly rocked on a horizontal axis so that the forward edge 24 of the fin is tilted up or down as the case may be with reference to a horizontal plane through the axis of bolt 14.

Extending vertically of the ship wall, in immediate proximity to the forward ends of all of the fins 12 of a given group, is a vertically reciprocatable rod 26 independently attached to each fin by a suitable pin and slot connection 28—30, whereby the rod may be reciprocated to simultaneously tilt all of the fins 12 of a given group about their respective independent pivotal bearings 16.

Any suitable means is provided at, say, the rail 32 of the ship for reciprocating each rod 26. In the particular case here illustrated, the means for operating each rod consists in the slow motion screw 34 manipulatable by a handle 36. In the particular form of screw mechanism shown, the screw happens to be journaled in the block 38 rigidly attached to the rail 32 of the ship by any suitable means as for instance the screw 40, and the lower end of the screw 34 is attached, for rotation only, to a lug 42 on the upper end of rod 26.

The particular method of rendering the rod 26 vertically reciprocatable of the ship's side is not material to this invention. The specific form of mechanism for this purpose which happens to be shown is an enclosing casing 44 for the rod let into the outside of member 20 heretofore referred to.

When a ship is to be equipped with the devices of this invention, a sufficient number of unitary mechanisms of the class just described is provided and attached to the side of the ship in the manner indicated so that the side of the ship carries at intervals along its length any suitable number of

groups of wings or fins 12, as shown in Figures 1 and 2. Best results are obtained by putting a greater number of fins in the series fore and aft than in the series abeam. Preferably the series fore and aft should have two or more times as many fins as the series abeam.

When all of the fins 12 are horizontal, as shown in Figure 1, the ship will move forward or back without the fins offering any material resistance to the movement of the ship, but the fins should be sufficient in number and in size so that they materially retard rolling of the ship, this because fins project into the water from what is otherwise a normally smooth ship surface, and thus provide a serious frictional resistance to rolling action.

The figures of the drawing happen to show the right hand ends of the various fins 12 somewhat thicker than the left hand ends, but this is a wholly immaterial matter which does not enter into the invention. The pointed left hand ends of these devices may be installed to point toward the front of the ship without departing from this invention, the only change necessary being to place the pivot bolts 16 on the right hand side instead of on the left hand side of the rods 26 and to rotate each of the fins through 180 degrees before they are connected in place.

When the operator adjusts the hand wheels 36 to point the fins controlled by them downward, all of these fins acting together will tend to carry the ship somewhat deeper into the water than it would normally travel, and thereby steady it. When the angularity of the fins is reversed, they tend to cause the ship to ride up on the water and thus somewhat reduce the frictional resistance to its forward movement. This is of advantage when the weather is calm.

In conjunction with the device described it is desirable, in the case of ships other than submarines, to place permanent upwardly forwardly pivoted fins 50 on and adjacent to the bow to assist in guiding the bow out of any waves it may enter.

Each fin or blade 12 is preferably made half round or half egg shaped as shown in Figure 4, so as to readily slide through sea weed or the like.

What I claim is:

1. The combination with a ship hull adapted to travel through water, of a plurality of fins each pivotally carried on the sides of the hull for angular adjustment with respect to the axis of the hull, said fins being arranged in series vertically of the hull, a common means for simultaneously and harmoniously adjusting the fins of each series, said means comprising a guide-way secured to the side of the hull, a rod slidable in the guide-way having pivotal connections with corresponding ends of the fins of the related series, and means for sliding said rods.

2. The combination with a ship hull adapted to travel through water, of a plurality of fins each pivotally carried on the sides of the hull for angular adjustment with respect to the axis of the hull, said fins being arranged in series vertically of the hull, a common means for simultaneously and harmoniously adjusting the fins of each series, said means comprising a guide-way secured to the side of the hull, a rod slidable in the guide-way having pivotal connections with corresponding ends of the fins of the related series, and screw operated means for sliding said rod.

3. The combination with a ship hull adapted to travel through water, of a plurality of fins each pivotally mounted on the sides of the hull for angular adjustment with respect to the axis of the hull, said fins being arranged in series vertically of the hull and the number of fins in the series in the fore and aft sections being greater than the number of fins in the series amidships, and a common means for simultaneously and harmoniously pivoting the fins of each series.

In witness whereof, I have hereunto subscribed my name.

GOTTLIEB F. ZUCKER.