Aug. 15, 1961 KARL-ERIK A. JONSSON 2,996,034

DEVICE FOR PROPELLING AND STABILIZING OF BOATS

Filed April 10, 1959 2 Sheets-Sheet 1

Fig. 1.

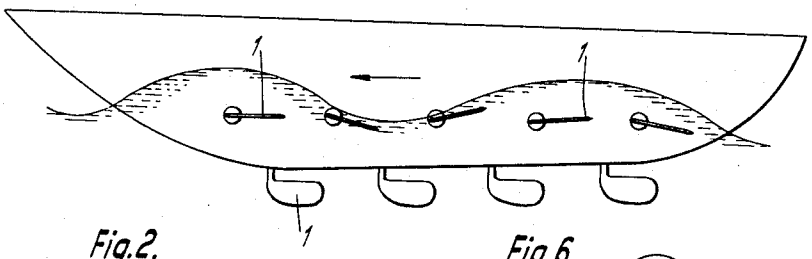


Fig. 2.

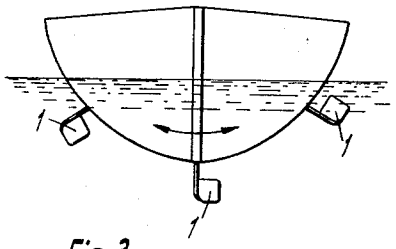


Fig. 6.

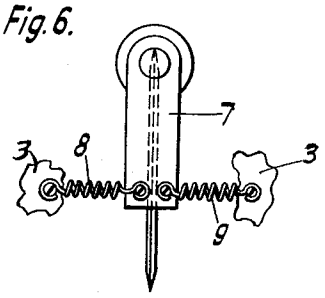


Fig. 3.

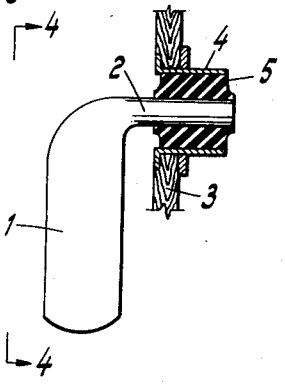


Fig. 5.

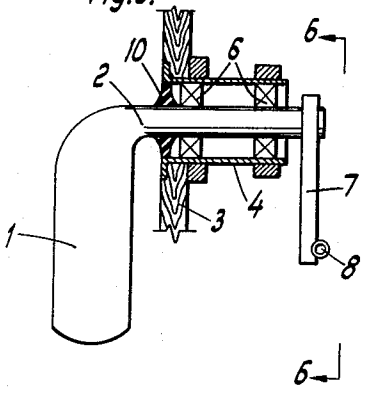
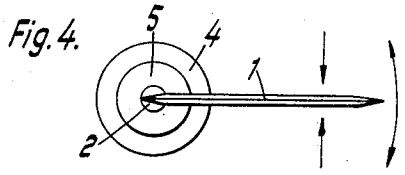


Fig. 4.



INVENTOR.

K-E. A. Jonsson

BY

Glascock Downing Seebold

ATTYS.

Aug. 15, 1961 KARL-ERIK A. JONSSON 2,996,034

DEVICE FOR PROPELLING AND STABILIZING OF BOATS

Filed April 10, 1959 2 Sheets-Sheet 2

Fig. 8.

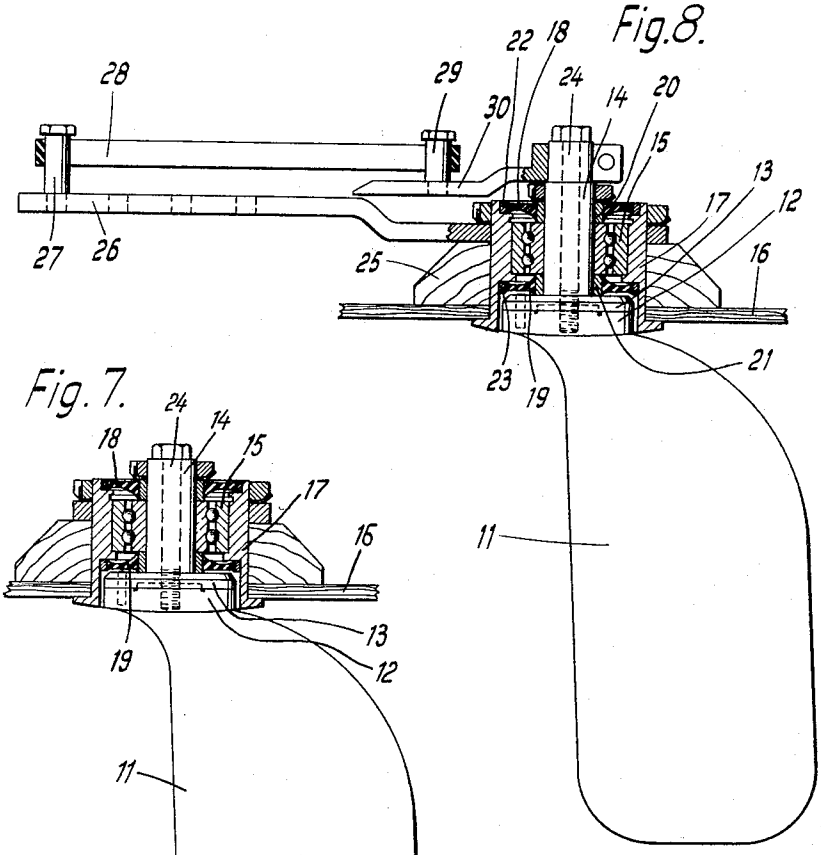


Fig. 7.

INVENTOR.

K-E. A. Jonsson

BY

Glascock Downing & Seebold

ATTYS

United States Patent Office 2,996,034 Patented Aug. 15, 1961

2,996,034

DEVICE FOR PROPELLING AND STABILIZING OF BOATS

Karl-Erik Arnold Jonsson, Brunnsgatan 63C, Gavle, Sweden

Filed Apr. 10, 1959, Ser. No. 805,591
Claims priority, application Sweden Apr. 17, 1958
12 Claims. (Cl. 115—4)

The present invention relates to the art of propelling and stabilizing boats where the propelling power is obtained by the movement upwards and downwards of the water in a wave in connection with the pitching of the boat or solely by producing side rolling in one or another manner of the boat.

The invention, while particularly advantageous as a means for propelling lifeboats and jolly-boats, may also be advantageously used as an auxiliary aggregate for propelling motor-boats and sailing-boats. The invention is principally characterized in that, at the sides of the boat and/or along its bottom respectively are provided stream-line shaped paddle-like members fixed to pivotably mounted, resiliently or elastically actuated shafts, and which paddle-like members provide a propelling force in response to relative movement between the boat and the water in a direction lying substantially in a plane at right angles to the longitudinal axis of the boat, and in connection with the pitching or rolling of the boat, respectively.

The invention further comprises an arrangement in which the shaft of each paddle-like member is resiliently pivotably mounted in the hull of of the boat in such a manner that the paddle-like member is forced to become adjusted at an angle to the actuating force, that is so suited that each paddle-like member will give to the boat a largest possible increment of force ahead. This result can be obtained by mounting the shaft of each paddle-like member in a socket of rubber connected to each shaft and to the hull of the boat, which socket by a correctly selected hardness of rubber and thickness will adjust the associated paddle-like member in the most advantageous position with regard to propelling.

Alternatively, instead of utilizing the rubber socket, which in fact is an annular member of rubber connected in shear between each shaft and the hull of the boat, a spring loaded lever connected to the shaft may be used. In connection with the mounting of the paddle-like members it will always include double-acting resilient means operable to impart turning movement in opposite directions. Other characteristics features of the invention will be explained in connection with the following description of embodiments illustrated in the attached drawing.

FIG. 1 shows a side view and FIG. 2 a front view of a boat provided with the propelling device according to the invention.

FIG. 3 is a view partly in elevation and partly in cross-section illustrating one of the paddle-like members with its shaft mounted in a socket of rubber.

FIG. 4 is an end view of the paddle-like member shown in FIG. 3.

FIG. 5 is an end view illustrating another embodiment of the mounting arrangement for the shaft of each paddle-like member.

FIG. 6 is a view similar to FIG. 3 and illustrating the paddle-like member shown in FIG. 5 with a spring-loaded lever connected to the shaft of the paddle-like member for adjusting such member in relation to the longitudinal axis of the boat.

FIGS. 7 and 8 are views similar to FIG. 3 but respectively illustrating further modifications of the mounting for the shafts of the paddle-like members.

In FIGS. 1 and 2 the propelling paddle-like members disposed along the sides of the boat and along the bottom thereof are schematically illustrated.

In FIG. 3 one of the paddle-like members 1 is fixed to a shaft 2, that is mounted in a casing 4, fixed to the hull or shell 3 of the boat, by means of a socket 5 of rubber that is connected to the shaft 2 and to the casing 4.

In the embodiment according to FIG. 5 the paddle-like member 1 is fixed to a shaft 2 that is journalled in the casing 4 by means of two bearings 6. At the inner end of the shaft 2 is fixed an arm or lever means 7, the free end of which is connected between two spiral shaped springs 8 and 9, the other ends of which are connected to the hull 3 of the boat. To prevent entry of water into the interior of the boat a sealing device in the form of a rubber member 10 is connected by vulcanization between the exterior of the shaft and the interior of the casing 4.

By correctly selecting the thickness and hardness of the rubber for socket 5 the paddle-like member can be forced to adjust itself into the most favourable position with regard to propelling. In the embodiment according to FIGS. 5 and 6, where the socket of rubber shown in FIG. 3 has been replaced by a spring loaded lever fixed to the shaft, the characteristic of the springs can likewise be adjusted for attaining the desired result in this respect.

FIG. 7 shows another embodiment of a mounting arrangement for paddle-like members disposed along the sides and/or the bottom of the boat. Each streamline-shaped paddle-like member 11 protruding from the hull of the boat includes a flange 12 which is connected to and supported by a flange 13 on a pivotable shaft 14. The shaft 14 is journalled in a ball-bearing 15 in a casing 17 that is fixed to the hull 16 of the boat. Two annular membranes of rubber 18 and 19 are vulcanized to rings 20 and 21 fastened to the shaft 14 at axially spaced points therealong and vulcanized to axially spaced rings 22 and 23 fixed to the casing 17. In order to obtain constant elasticity in these membranes 18 and 19 the thickness of the same decreases towards their outer circumference. For holding flanges 12 and 13 together there is provided a screw 24 that is screwed into the flange 12. A guide pin passes through the flanges 12 and 13.

Compared with the paddle-like member illustrated in FIGS. 3–5 the paddle-like member 11 presents the advantage of affording the possibility of greater angular deviations due to its having smaller dimensions at right angles to the center line of its shaft than the corresponding dimensions of paddle-like member 1. Thus it is possible to utilize smaller movements of the paddle-like member. For strengthening the casing 17 with respect to the hull 16 the casing is surrounded by a wooden collar 25.

The embodiment illustrated in FIG. 8 differs from that one according to FIG. 7 in that it includes an arm 26 there fixed to the housing 17. This arm 26 is provided with several holes in its longitudinal direction. In one hole there is fixed a bolt 27. On the shaft 14 there is fixed another arm or lever means 30 provided with holes for receiving a bolt 29. This bolt 29 is connected with the other bolt 27 by means of one or more bands of rubber for obtaining the required elastic force. The elastic force on the paddle-like member thus can be obtained either by the rubber-membranes 18, 19 only, or by these membranes together with the rubber-band 28. The membranes 18, 19 not only provide the required elastic force, but they also function as a sealing means. Depending on the hardness of the rubber used the desired elastic force can be attained.

It is therefore clear that the present invention pro-

vides an improvement in boat stabilizing and propelling arrangements of the type in which a plurality of movable paddle members are arranged along the sides and/or along the center line of the bottom of the boat below the water line thereof, which includes turnable shaft means carried by the boat, extending transversely of the longitudinal axis of the boat and mounting each paddle member for turning movement. Each paddle member includes a rigid stream-lined blade connected to its associated shaft means so that as regards the direction of movement to be imparted to the boat all effective surfaces of each blade lie behind the axis of its associated shaft means. Further, resilient means are connected between each shaft means and the boat for applying a resilient turning force to the respective shaft means tending to move the associated paddle members in a direction opposite to that in which they were moved in response to a relative movement between the boat and the water occasioned by a rolling or pitching movement of the boat in any direction.

Further, the invention provides an arrangement in which solid-elastic-rubber material means are connected between each shaft means and an aperture in the hull or shell of the boat for applying a resilient turning force to the respective shaft means. This solid-elastic-rubber material means can constitute at least one annular rubber member or bushing connected in shear between the aperture and the hull or shell and each shaft means, it can constitute a plurality of annular membranes of rubber material connected between the hull of the boat at axially spaced points along each shaft, or it can constitute rubber strip means connected in tension between a stationary point on the boat and the respective shaft means.

The invention is not to be restricted to the precise arrangements shown in the drawings, since variations in structure are contemplated so long as they wall within the scope of the appended claims.

What I claim is:

1. In a boat stabilizing and propelling arrangement of the type in which a plurality of movable paddle-like members are arranged along the sides and/or along the center line of the bottom of the boat below the water line thereof, turnable shaft means carried by the boat, extending transversely of the longitudinal axis of the boat and mounting each paddle-like member for turning movement, resilient means connected between each shaft means and the boat for applying a resilient turning force to each shaft means tending to move the respective paddle-like member in a direction opposite to that in which they were moved in response to a relative movement between boat and water occasioned by a rolling or pitching movement of the boat in any direction, said resilient means comprising a socket of rubber connected to the boat and to each shaft means, and the hardness and thickness of the rubber of said socket being so selected that each paddle-like member is forced to adjust itself in the most favorable position with regard to propelling.

2. In a boat stabilizing and propelling arrangement of the type in which a plurality of movable paddle-like members are arranged along the sides and/or along the center line of the bottom of the boat below the water line thereof, turnable shaft means carried by the boat, extending transversely of the longitudinal axis of the boat and mounting each paddle-like member for turning movement, resilient means connected between each shaft means and the boat for applying a resilient turning force to each shaft means tending to move the respective paddle-like member in a direction opposite to that in which they were moved in response to a relative movement between boat and water occasioned by a rolling or pitching movement of the boat in any direction, a casing surrounding each shaft in spaced relation thereto and fixed to the boat, said resilient means comprising rubber membranes vulcanized to each shaft and to the surrounding casing, and said membranes further constituting sealing means preventing entry of water into the boat.

3. In a boat stabilizing and propelling arrangement of the type in which a plurality of movable paddle members are arranged along the sides and/or along the center line of the bottom of the boat below the water line thereof, turnable shaft means carried by the boat, extending transversely of the longitudinal axis of the boat and mounting each paddle member for turning movement, each paddle member including a rigid stream-lined blade connected to its associated shaft means so that as regards the direction of movement to be imparted to the boat all effective surfaces of each blade lie behind the axis of each shaft means, and double-acting resilient means connected between each shaft means and the boat for applying a resilient turning force to each shaft means tending to move the respective paddle members in a direction opposite to that in which they were moved in response to a relative movement between boat and water occasioned by a rolling or pitching movement of the boat in any direction.

4. In a boat stabilizing and propelling arrangement of the type in which a plurality of movable paddle members are arranged along the sides and/or along the center line of the bottom of the boat below the water line thereof, turnable shaft means carried by the boat, extending transversely of the longitudinal axis of the boat and mounting each paddle member for turning movement, each paddle member including a rigid stream-lined blade connected to its associated shaft means so that as regards the direction of movement to be imparted to the boat all effective surfaces of each blade lie behind the axis of each shaft means, resilient means connected between each shaft means and the boat for applying a resilient turning force to each shaft means tending to move the respective paddle members in a direction opposite to that in which they were moved in response to a relative movement between boat and water occasioned by a rolling or pitching movement of the boat in any direction, lever means connected to each shaft means and extending parallel to the plane containing the associated blade, and said resilient means comprising double acting spring means connected between said lever means and the boat.

5. In a boat stabilizing and propelling arrangement of the type in which a plurality of movable paddle members are arranged along the sides and/or along the center line of the bottom of the boat below the water line thereof, turnable shaft means carried by the boat, extending transversely of the longitudinal axis of the boat and mounting each paddle member for turning movement, each paddle member including a rigid stream-lined blade connected to its associated shaft means so that as regards the direction of movement to be imparted to the boat all effective surfaces of each blade lie behind the axis of each shaft means, resilient means connected between each shaft means and the boat for applying a resilient turning force to each shaft means tending to move the respective paddle members in a direction opposite to that in which they were moved in response to a relative movement between boat and water occasioned by a rolling or pitching movement of the boat in any direction, lever means connected to each shaft means and extending parallel to the plane containing the associated blade and rearwardly of the axis of the shaft means as regards the direction of movement of the boat, and said resilient means comprising coil springs connected between the boat and opposite sides of said lever means.

6. In a boat stabilizing and propelling arrangement of the type in which a plurality of movable paddle members are arranged along the sides and/or along the center line of the bottom of the boat below the water line thereof, turnable shaft means carried by the boat,

extending transversely of the longitudinal axis of the boat and mounting each paddle member for turning movement, each paddle member including a rigid stream-lined blade connected to its associated shaft means so that as regards the direction of movement to be imparted to the boat all effective surfaces of each blade lie behind the axis of each shaft means, resilient means connected between each shaft means and the boat for applying a resilient turning force to each shaft means tending to move the respective paddle members in a direction opposite to that in which they were moved in response to a relative movement between boat and water occasioned by a rolling or pitching movement of the boat in any direction, lever means connected to each shaft means to extend parallel to the plane containing the associated blade means and forwardly of the axis of the shaft means as regards the direction of movement of the boat, and said resilient means comprising rubber band means connected in tension between said lever means and the boat at a point forwardly of the axis of each shaft means.

7. In a boat stabilizing and propelling arrangement of the type in which a plurality of movable paddle members are arranged along the sides and/or along the center line of the bottom of the boat below the water line thereof, turnable shaft means carried by the boat, extending transversely of the longitudinal axis of the boat and mounting each paddle member for turning movement, each paddle member including a rigid stream-lined blade connected to its associated shaft means so that as regards the direction of movement to be imparted to the boat all effective surfaces of each blade lie behind the axis of each shaft means, resilient means connected between each shaft means and the boat for applying a resilient turning force to each shaft means tending to move the respective paddle members in a direction opposite to that in which they were moved in response to a relative movement between boat and water occasioned by a rolling or pitching movement of the boat in any direction, and the extent of each blade in a direction parallel to the axis of its associated shaft means being substantially in excess of the extent of each blade in a direction perpendicular to the axis of its associated shaft means.

8. In a boat stabilizing and propelling arrangement of the type in which a plurality of movable propelling blade members are aranged at the sides and/or along the center line of the bottom of the boat below the water line thereof, the improvements comprising a boat hull having a plurality of apertures therethrough corresponding in number and arrangement to the number and arrangement of propelling blade members, each blade member including a rigid stream-lined blade portion, a shaft for each blade member connected thereto to extend from the leading edge of the blade member as regards the direction of

movement of the boat so that all of the effective surfaces of each blade member lie behind the center line of the associated shaft, and mounting means including double-acting resilient means connected between the hull of the boat and each shaft for resiliently mounting the shafts in said apertures for turning movement about axes extending transversely of the longitudinal axis of the hull, said mounting means further including means preventing entry of water into the hull, whereby a propelling force can be imparted to the boat by relative movement between the boat and the surrounding water substantially in a direction at right angles to the longitudinal axis of the boat in response to pitching or rolling movements of the boat, and said double-acting resilient means tending to impart turning movement to each shaft in a direction opposite to that direction in which the shaft was turned by said relative movement.

9. In a water craft stabilizing and propelling arrangement, a floatable frame, a plurality of paddle members carried by the frame, turnable shaft means carried by the frame, extending transversely of the longitudinal axis thereof and mounting each paddle member for turning movement, and solid-elastic-rubber material means connected between each shaft means and the frame for applying a resilient turning force to each shaft means tending to move the respective paddle members in a direction opposite to that in which they were moved in response to relative movement of frame and water occasioned by rolling or pitching movement of the frame.

10. A water craft stabilizing and propelling arrangement as claimed in claim 9, in which the solid-elastic-rubber material means constitutes at least one annular rubber member connected in shear between the frame and each shaft means.

11. A water craft stabilizing and propelling arrangement as claimed in claim 9, in which the solid-elastic-rubber material means constitutes a plurality of annular membranes of rubber material connected between the frame and axially spaced points along each shaft means.

12. A water craft stabilizing and propelling arrangement as claimed in claim 9, in which said solid-elastic-rubber material means constitutes rubber strip means connected in tension between the boat and each shaft means.

References Cited in the file of this patent

UNITED STATES PATENTS

687,910	Waters	Dec. 3, 1901
2,520,804	Hollar	Aug. 29, 1950
2,809,604	Meredith	Oct. 15, 1957

FOREIGN PATENTS

326,058	Switzerland	Jan. 15, 1958