

[54] SAILING GEAR FOR WATER CRAFT

[76] Inventor: **Lauri Antero Katainen**, Mantyviite
4 A 14, 02100 Tapiola, Finland

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Primary Examiner—Trygve M. Blix
Assistant Examiner—Gregory W. O'Connor
Attorney, Agent, or Firm—Kurt Kelman

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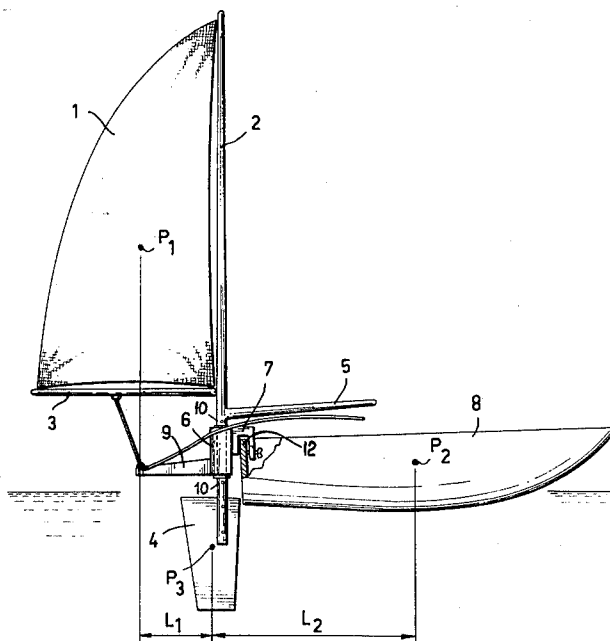
UNITED STATES PATENTS

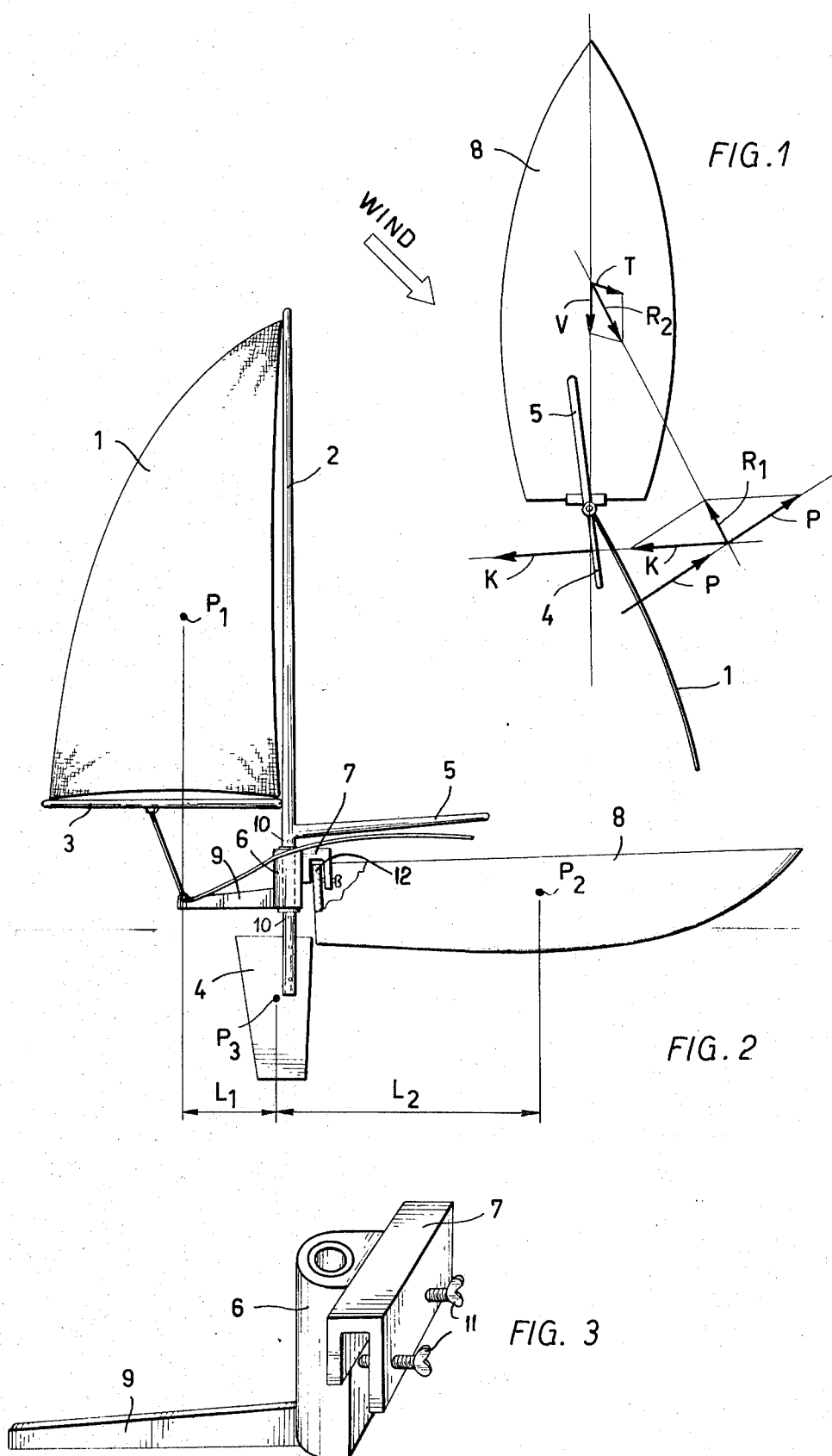
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[57] ABSTRACT

A sailing device is disclosed for attachment to the rear of a watercraft. The sailing device comprises a mast, a boom, a sail attached to the mast and the boom, a combined rudder and keel and means for supporting and fastening the device to the rear of the watercraft. When the device is mounted for use the mast, the boom, the sail and the combined rudder and keel all are located behind the rear of the watercraft.

3 Claims, 3 Drawing Figures





SAILING GEAR FOR WATER CRAFT

Because of the difficulty of attaching the keel, the construction of sail-powered watercraft must be planned, almost without exception, specifically for that purpose. One purpose of the invention is to eliminate the drawback mentioned above and to bring into use equipment that can be attached without large scale alteration to the watercraft in order to convert it partly or completely to be driven by sail.

The general opinion is that in a sailing craft the center of gravity of the sail surface has to be situated in the direction of the longitudinal axis in the middle or in the immediate vicinity in order that the sailing properties might be the best possible. Under the present invention the center of gravity of the sail surface of the vehicle has been moved to the rear. This can be done if the center of gravity of the keel of the vehicle is situated approximately on the same vertical as the joint center of gravity of the sail surface and the cross surface above the water.

In the accompanying diagram the invention has been illustrated with examples, whereat:

FIG. 1 presents schematically the boat seen from above and provided with sailing equipment according to the invention,

FIG. 2 presents the boat with sailing equipment seen from the side, and

FIG. 3 is a fastening device for the sailing equipment perspectively on a bigger scale.

By means of the indicators in the accompanying diagram of FIG. 2, a ratio is obtained, which must roughly prevail in order that the vehicle might sail in the best possible way:

$$L_1 : L_2 = A_2 : A_1$$

in which A_1 is the area of the sail and of which the center of gravity is situated at point P_1 ; and A_2 is the projection surface of the above water part of the vehicle vertically in the plane parallel to the longitudinal axis; and the center of gravity of which is situated at point P_2 . The center of gravity of the keel surface is situated at point P_3 .

The behaviour during the cruise of the gear under the invention can be described simply thus referring to diagram FIG. 1: The force T caused by the wind will affect the vehicle 8. The resistance of the water V will affect the vehicle. The force P caused by the wind will affect the sail 1. The keel 4 will be affected by the lift K , the size of which is essentially dependent of the angle between the keel and the course. The resultant R_1 of the forces K and P will be of the same size and of opposite direction and will be situated in the same line as the resultant R_2 of the forces T and V , if a person steering the craft performs the steering by turning the keel 4 by means of the tiller 5. If the balance of the vehicle is not the most advantageous, the possible force V will not be placed parallel to the longitudinal axis.

In the accompanying FIG. 2, a water craft driven by a sail according to the invention is presented. There is a sail 1 which is in normal manner attached to the mast 2 and boom 3. The keel 4 is attached to the lower part of the mast and a little higher up the tiller 5. The mast 2 is fastened on a bearing to the hull 6, i.e., a casing support. Vertical movement of mast 2 in hull 6 is limited by means of, for example, cotter pins 10. In the framepiece and there is a projection 9 for sheet home, i.e., attachment by a cord to boom 3. To the hull 6 is attached a fastening device 7 so that the position between them can be changed in the longitudinal direction of the craft by listing either forwards or backwards. However, the diagram shows only a fixed adaptation. In order to enable inclining movement forwards and backwards, the casing support or hull 6 can be hinged to the fastening device 7 by providing, in a known manner, means such as fastening devices used in connection with outboard motors. One or several vertically and aligned or adjacently disposed hinges horizontally attached by an axle pin may be used. Alternatively, the axle pin may have threads and a bolt so that the flanges may be pressed against each other and thus lock parts 6 and 7 to each other. In the flanges there may be other holes which, when placed face to face and cotter pinned will improve the maintenance of the locking position.

The fastening device itself may be attached to the transom of the boat in the same way as an outboard motor, e.g., with wing-nuts 11, pressing the transom 12 against the inner edge of the fastening device.

Divergent from present sailing vehicles, it is possible under the invention to sail in such a way that the course of the vehicle is exactly the same as the running direction. In a device according to the invention, the efficiency of the sailing craft will somewhat be better than that of an ordinary sailing craft, since the "wet surface" will diminish due to the unification of keel and rudder.

In order to improve the turning and sailing properties, the equipment can be provided in certain cases with an auxiliary keel smaller than the ordinary keel and placed somewhere else other than in the rear. The attachment of the keel to the mast can be planned so as to allow a temporary change in the immersion of the craft by changing the position of the keel. The sail surface may also be formed out of a number of sails.

I claim:

1. A sailing device for attachment to the rear of a watercraft which comprises in combination:

- A. means for fastening the sailing device to the rear of the watercraft,
- B. casing support means disposed to said means for fastening,
- C. a mast supported by said casing support means,
- D. a boom and a sail attached to said mast,
- E. a combined rudder and keel attached to said casing support means, and
- F. means for maneuvering the combined rudder and keel,
- G. said mast, boom, sail and combined rudder and keel all being disposed behind the rear of the watercraft, said means for maneuvering being disposed forward of the rear of the watercraft.

2. The sailing device of claim 1, wherein said support means has a rearwardly projecting member for sheet home of the sail.

3. The sailing device of claim 1, wherein said casing support means is pivotable relative to said means for fastening about a horizontal axis transverse to the watercraft.

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