

[54] **SURFING SAILBOAT**

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[51] Int. Cl. **B63h 9/06**

[58] Field of Search..... **114/39, 102, 124**

[56] **References Cited**

UNITED STATES PATENTS

521,388	6/1894	Pool.....	114/39
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[57] **ABSTRACT**

The disclosure is directed to a sailboat which is constructed for riding in surfboard fashion. The boat includes a sail which is symmetrically mounted for rotation about a vertical mast. The mast is disposed toward the rear of the boat in order that wind striking the sail may serve to both steer and power the boat, and to give the rider unobstructed forward vision. Direction of boat movement is determined by angular deviation or side tipping of the boat hull from its normal floating position. Tipping is affected by weight shifting on the part of the rider, and is sensed by apparatus which governs attitude of the sail with respect to the wind.

14 Claims, 10 Drawing Figures

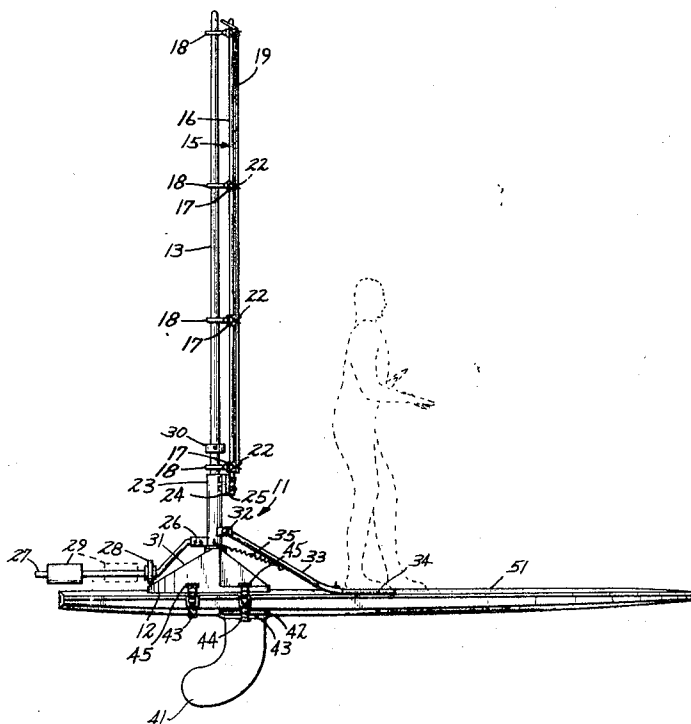


FIG. 1

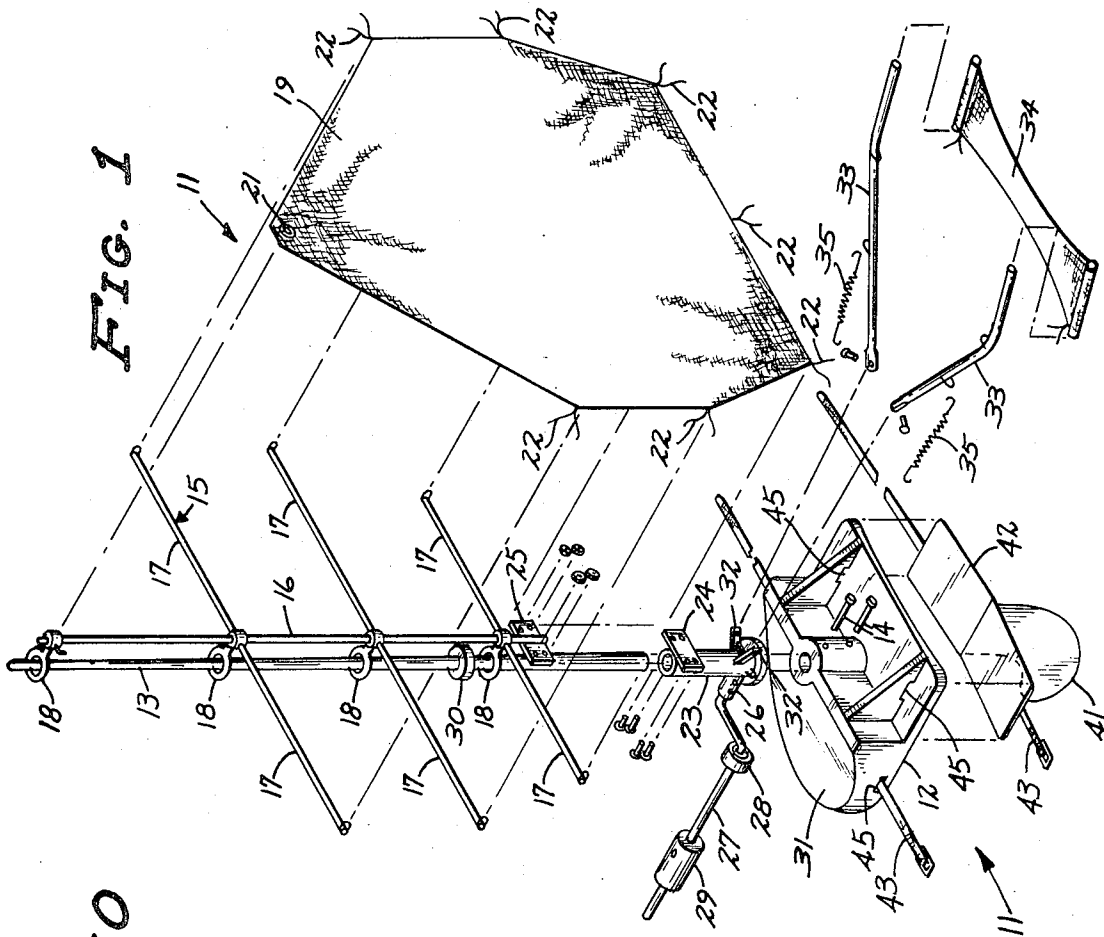
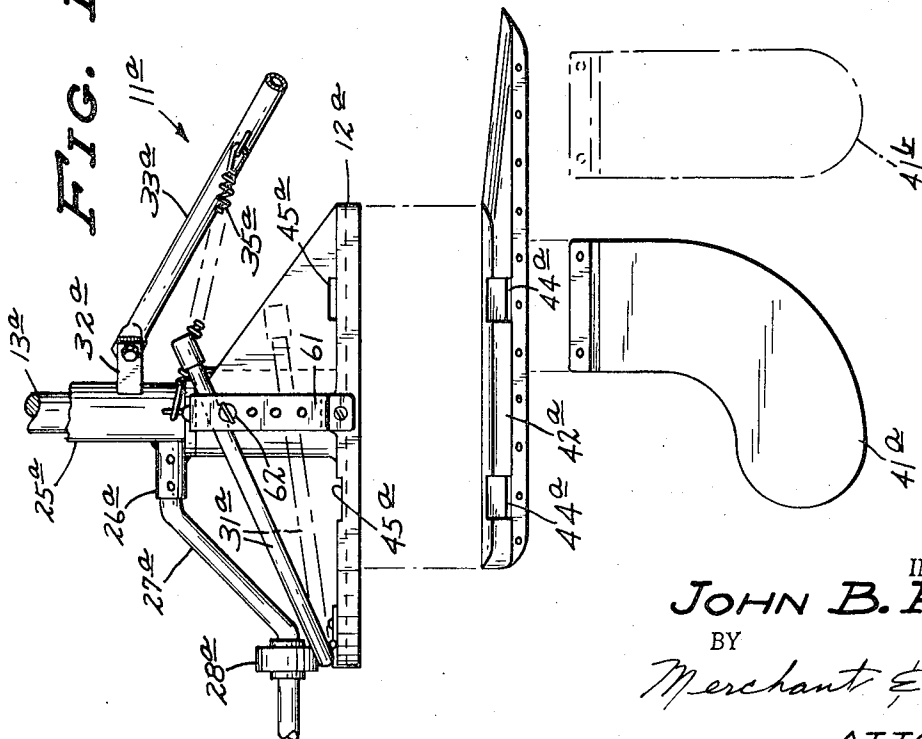
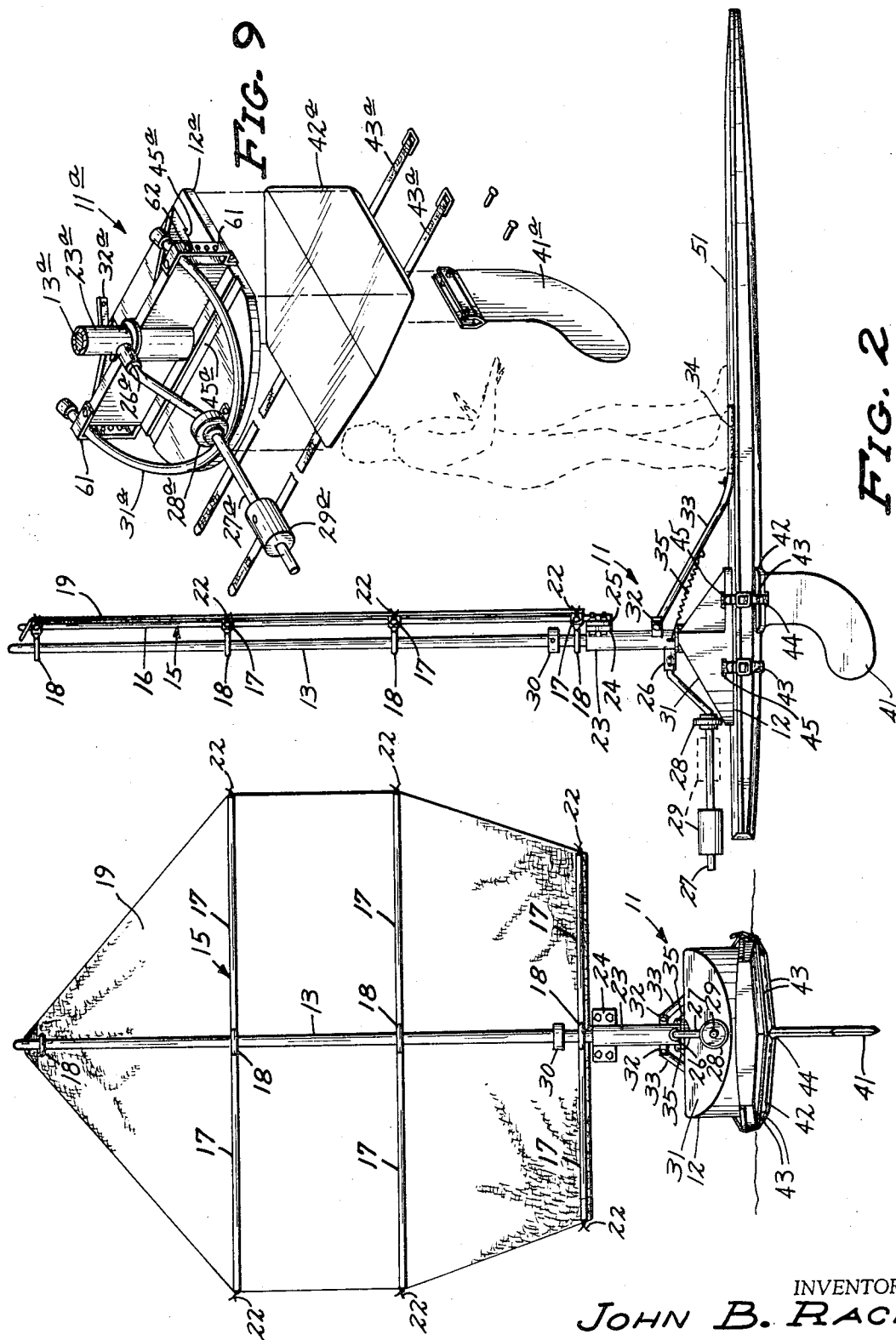


FIG. 10



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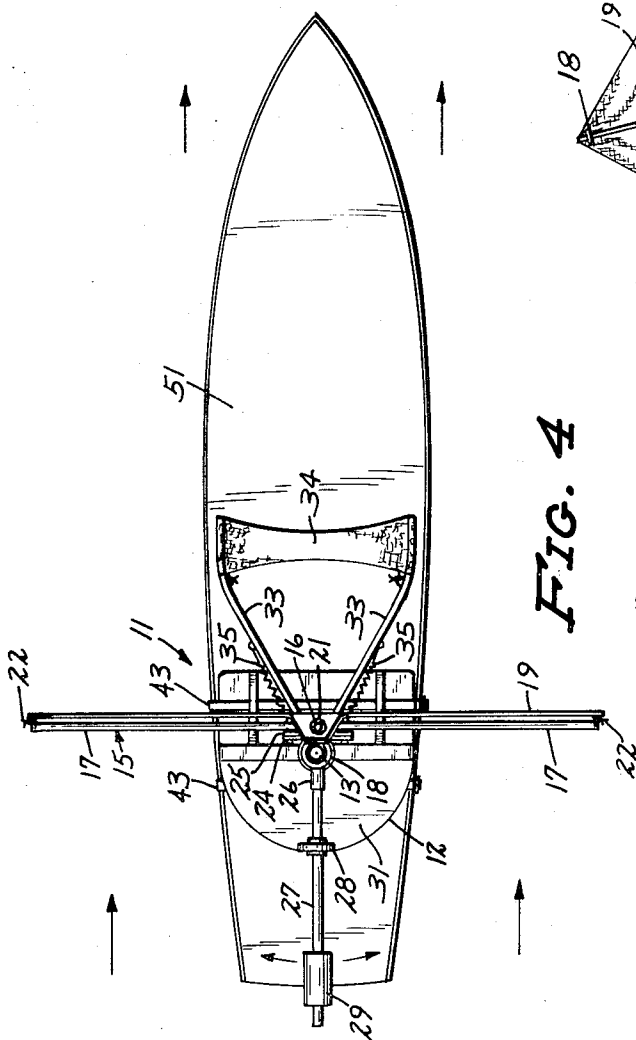


FIG. 4

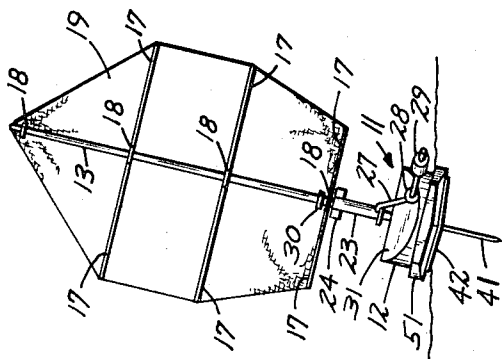


FIG. 5

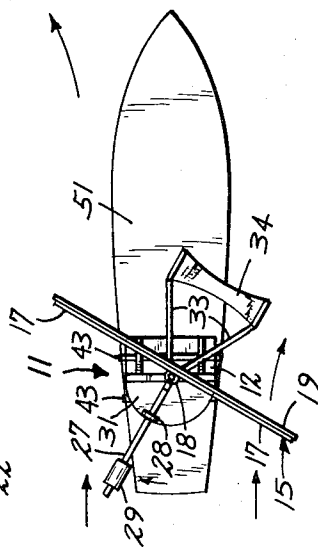


FIG. 6

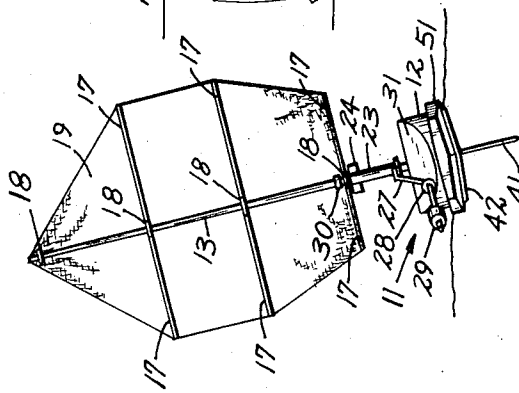


FIG. 7

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SURFING SAILBOAT

The invention is related specifically to sailboats which are designed for riding in surfboard fashion.

This type of craft has an unique appeal to water sports enthusiasts because it combines the fun of sailing with the excitement of ocean surfing. It can be enjoyed on bodies of water other than oceans and, obviously, does not require waves for motivation. Because of their extreme light weight, surfing sailboats need only the slightest breeze to get under way.

One type of surfing sailboat forms the subject matter of U.S. Pat. No. 3,487,800, issued to Hoyle Schweitzer and James Drake on Jan. 6, 1970. In the Schweitzer et al. patent, the mast is pivotally mounted to the surfboard or hull by a universal joint rather than being rigidly secured. The rider holds the mast and sail upright and controls the direction of boat movement by maneuvering the mast and sail fore and aft.

As with the other types of surfing sailboats of which I am aware, the Schweitzer et al. boat is controlled by manual movement of the sail by the rider. To the best of my knowledge, there is no boat in the prior art in which the sailor-surfer assumes and maintains a balanced position on the board and effects steering merely through the shifting of his weight in true surfboard fashion.

My invention accomplishes this objection through apparatus which senses angular deviation or side tipping of the board from its normal floating position and changes the attitude of the sail accordingly. In the preferred embodiment, this apparatus comprises a sail symmetrically mounted on a frame for rotation about the vertical mast. The sail frame is connected to a weighted arm which is horizontally disposed and moves circumferentially on an inclined track. Thus, as the rider tips the boat to one side, the weighted arm moves by gravity in the same direction to the lowest point on the track. This causes the sail to rotate about the mast, changing its attitude with respect to the wind and thereby altering the direction of boat movement.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded perspective view of sailboat steering apparatus embodying the inventive principle;

FIG. 2 is a side elevational view of the steering apparatus mounted on a boat hull;

FIG. 3 is a rear elevational view of the steering apparatus and boat hull;

FIG. 4 is a top plan of the steering apparatus as mounted on the boat hull;

FIGS. 5-8 depict various operational positions of the steering apparatus in effecting a desired direction of movement;

FIG. 9 is a fragmentary exploded view of an alternative embodiment of the steering apparatus; and

FIG. 10 is an enlarged fragmentary view in side elevation of the alternative steering apparatus, showing also an alternative center board.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. 1, a sailing and steering apparatus constructed and arranged for mounting on a suitable boat hull is represented generally by the numeral 11. Apparatus 11 comprises a frame 12 which rigidly supports

a vertically disposed mast 13 as by bolts 14. A sail frame shown generally at 15 comprises a single-vertical member 16 and a plurality of horizontally disposed support members 17 which are interconnected by a plurality of ring members 18. Members 18 are axially aligned and disposed for slidable movement on mast 13. A sail 19, preferably symmetrical in shape, includes an eyelet 21 which slips over the upper end of vertical member 16 and a plurality of tie strings 22 which are appropriately placed for tying through loops disposed at the outer ends of horizontal members 17.

Disposed at the base of mast 13 and freely rotatable with respect thereto is a length of pipe 23, which normally rests on frame 12. Rigidly attached to the top of pipe 23 is a bracket plate 24 which is bolted to a second bracket plate 25 similarly attached to the bottom of vertical member 16. Thus, rotation of the length of pipe 23 causes a similar rotation of sail 19.

A short tube 26 is rigidly attached to the rear side of pipe 23 to receive and support an arm member 27. Arm 27 angles downwardly after its connection to tube 26, and its lowermost portion carries a roller 28 at an intermediate point and a weight 29 the position of which is adjustable between roller 28 and the outer end.

The rear peripheral portion of frame 12 forms a ramp 31 which is radially disposed with respect to mast 13. Ramp 31 serves as a track for roller 28 and arm 27, and is inclined upwardly from its midpoint in both directions. This inclination of ramp 31 is provided to restrain the movement of arm 27 when frame 12 is tipped away from its normal horizontal position, and to permit arm 27 to swing back toward the midpoint when frame 12 resumes the normal position. In the absence of ramp 31, the tipping of frame 12 would permit arm 27 to swing uncontrollably outward by the affect of gravity on weight 29, and its return would be unpredictable if it occurred at all. With the inclined ramp, however, such movement is restrained, and arm 27 seeks the lowest position on track 31 when frame 12 is tipped.

The front side of pipe 23 carries a pair of rigidly attached bracket members 32 each of which pivotally supports an arm member 33. Arms 33 are connected by a length of strong fabric 34, which permits the assembly to serve as a manual steering mechanism for the boat as described in further detail below. A coil spring 35 connected in over-center fashion between each of the arms 33 and frame 12 permits the steering assembly to be held in either a downwardly projecting position where it can be grasped for manual steering of the craft, or in an upward position which is out of the way and does not hinder the rider during surfing operation.

The preferred embodiment of apparatus 11 also includes a centerboard 41 which serves to stabilize the watercraft as it moves through the water. Centerboard 41 is attached to a dihedral member 42, which in turn is constructed to be releasably fastened to the bottom of the hull. Preferably, this fastening is accomplished through a pair of straps 43, one of which passes through a notch 44 in dihedral member 42, encircles the boat hull and passes through aligned openings 45 in frame 12 before being buckled down. An alternative centerboard 41b (FIG. 10) may be used, depending on wind conditions and the degree of maneuverability and stability desired.

Steering and sailing apparatus 11 may be fastened to a boat hull 51 by the pair of straps 43, as shown in FIGS. 2 and 9. For best results, apparatus 11 is positioned on the aft portion of hull 51 as shown. This not only provides the most responsive steering, but also gives the rider unobstructed forward vision.

Operation of the craft is shown in FIGS. 4-8. For movement against the wind, operation is in the traditional sailing manner; i.e., various tacks may be taken by moving arms 33 to their downward position and manually rotating the mast and sail. If it is desired, the rider can assume a surfing position and maintain the sail at a desired attitude by standing on fabric 34.

When a desirable location has been reached, the boat is guided for movement with the wind at which time the rider assumes a surfing position (standing, sitting or lying down) immediately forward of arms 33 which permits the simple shifting of body weight. With sail 19 set perpendicularly to the wind direction, the boat remains in its normal floating position and proceeds straight through the water. If the rider wishes the craft to bear to the right, he need only shift his weight to the starboard side as shown in FIGS. 5 and 6. This causes the craft to angularly deviate or tip from its normal floating position, which in turn causes weight 29 to also move in the starboard direction. Thus, roller 28 is moved to the lowest available position on track 31, which rotates sail 19 about mast 13. Rotation of sail 19 also causes it to move axially upward on mast 13 by reason of the incline of track 31. A stop 30 affixed to mast 13 (FIG. 3) limits upward movement of sail 19, and thereby limits its rotational movement in either direction.

Because of the rearward position of steering apparatus 11 on hull 51, the wind, in obliquely striking sail 19, tends to move the aft portion of the boat to the left of the forward portion. Centerboard 41 prevents a full drift to the left, assists in transmitting the wind force in the altered direction and stabilizes the boat in the tipped position. The overall result is movement of the boat to the right.

FIGS. 7 and 8 depict movement of the craft to the left, which is accomplished by the rider shifting his weight to the port side. Weight 29 follows until roller 28 is situated at the lowermost portion on track 31. The attitude of sail 19 being changed, the wind drives the aft portion of the craft outward with respect to the forward portion, causing movement to the left.

For maximum performance and speed when moving with the wind, hull 51 is tipped alternatively from side to side to effect a zig-zag movement through the water. When the craft is in a tipped or heeled position, there is less frictional resistance or water drag due to the decreased hull surface area below the water line. The result is increased boat speed. Further, as the sail rotates from side to side with alternate heeling, it passes through a position perpendicular to the wind direction, at which point there is a pressure build-up behind the sail. Further rotational movement to either side serves as a release of this pressure build-up which, I have found, also has the effect of momentarily increasing boat speed.

FIGS. 9 and 10 show an alternative steering apparatus 11a in which like members are designated with like numerals, and the designation of modified mem-

bers includes the reference letter *a*. The primary difference in steering apparatus 11a lies in the modified ramp, which is formed from a section of arcuate tubing 31a. The midpoint of tubing 31a rests on the rear edge of frame 12a with the inclined arm portions projecting forwardly. Each of these arm portions is fastenable by means of a thumb screw 62 to a bracket member 61, which is rigidly supported by frame 12a. Bracket 61 includes a plurality of aligned openings which permit the pitch or angle of inclination of tubing 31a to be varied (see dotted line in FIG. 10). This adjustment of tubing 31a allows steering apparatus 11a to be easily adapted to particular wind conditions. Specifically, under strong wind conditions tubing 31a should be adjusted to the position represented by solid lines in FIG. 10, since this offers more resistance to outwardly swaying movement of arm 27 as hull 51 is tipped and permits arm return movement when hull 51 resumes its normal horizontal position. It is evident that the angle of inclination of tubing 31a is commensurately decreased under lesser wind conditions. Thus, the adjustment of tubing 31a provides the proper bias for steering apparatus 11a to effect the desired operating performance.

Centerboard 41a is also adjustable on dihedral member 42 to vary the degree of maneuverability. The entire steering apparatus 11 can also be moved forward or aft to achieve different handling characteristics. Generally speaking, movement of apparatus 11 toward the center of hull 51 results in a lesser steering effect because of the decreased moment arm length (distance between mast 13 and the center of hull 51) through which the wind force acts. Of course, if apparatus 11 were positioned forward of the center of hull 51, the steering affect would be opposite; i.e., with the sail in the position shown in FIG. 8, the boat would bear to the right rather than to the left. As mentioned above, the more desirable operating position of apparatus 11 is on the aft portion of hull 51.

What is claimed is:

1. Apparatus adapted for releasable connection to the top side of a boat hull, comprising:
 - a. a frame normally occupying a horizontal position and constructed to be tipped from side-to-side to varying positions of angular deviation from the normal horizontal position;
 - b. a mast carried by the frame and projecting upwardly therefrom;
 - c. sail means supported by the mast with approximately equal areas on each side thereof, the sail means being rotatable about the mast to various sailing attitudes;
 - d. and control means for sensing the angular deviation of the frame from its normal horizontal position, for moving the sail means to a first plurality of attitudes respectively corresponding to frame positions of increased angular deviation from the normal horizontal position to one side thereof, for moving the sail means to a second plurality of attitudes respectively corresponding to frame positions of increasing angular deviation from the normal horizontal position to the other side thereof, and for restraining sail means movement from a specific attitude while the frame means remains in its corresponding position.

2. The apparatus as defined by claim 12, and further comprising a centerboard adapted for releasable connection to the bottom of the boat hull.

3. A sailboat comprising:

- a. a hull of predetermined size and having a normal floating position;
- b. a mast carried by the hull and projecting upwardly therefrom;
- c. sail means movably supported by the mast;
- d. means for sensing the angular deviation from the normal floating position of the hull and for moving the sail means to a particular position as a function of said angular deviation; and
- e. means for manually controlling the position of the sail means, comprising
 - 1. a pair of arm members pivotally connected to the sail means for upward and downward movement;
 - 2. means for interconnecting the outer ends of the arm members; and
 - 3. means for maintaining the arm members in an upper position and a lower position.

4. The sailboat defined by claim 3, wherein the arm interconnecting means comprises a length of fabric.

5. A surfing sailboat comprising:

- a. a hull adapted for riding in surf board fashion, the hull having a normal floating position and so constructed that it can be tipped from side-to-side by a rider to varying positions of angular deviation from the normal horizontal position;
- b. a mast carried by the hull and projecting upwardly therefrom;
- c. sail means supported by the mast with approximately equal areas on each side thereof, the sail means being rotatable about the mast to various sailing attitudes;
- d. and means for sensing angular deviation of the hull from its normal horizontal position, or moving the sail means to a first plurality of attitudes respectively corresponding to hull positions of increasing angular deviation from the normal horizontal position to one side thereof, for moving the sail means to a second plurality of attitudes respectively corresponding to hull positions of increasing angular deviation from the normal horizontal position to the other side thereof, and for restraining sail means movement while the hull remains in its corresponding position.

6. The surfing sailboat as defined by claim 5, wherein the control means comprises:

- a. an arm affixed to the sail means and projecting laterally therefrom, the arm being movable with rotation of the sail means;
- b. a weight disposed on the arm toward its outer end;
- c. ramp means radially disposed with respect to the mast;
- d. means for adapting the arm to the ramp means;
- e. the arm having a normal position at an intermediate point on the ramp means corresponding to the normal floating position of the hull; and
- f. the ramp means being inclined upwardly in both directions from said intermediate point.

7. The sailboat as defined by claim 6, wherein the position of the weight on the arm is adjustable.

8. The sailboat as defined by claim 6, wherein the means for adapting the arm to the ramp means comprises a roller member carried by the arm.

9. The sailboat as defined by claim 3, wherein the angle of inclination of the ramp means is adjustable.

10. The surfing sailboat defined by claim 5, wherein:

- a. the sail means is disposed for rotatable movement about the mast in either angular direction from a central position transverse to the line of hull movement;
- b. the first plurality of attitudes corresponds to those rotational positions of the sail means which begin at the central position and increase angularly therefrom in a first direction;
- c. and the second plurality of attitudes corresponds to those rotational positions of the sail means which begin at the central position and increase angularly therefrom in the opposite direction.

11. The sailboat as defined by claim 5, and further comprising a centerboard affixed to and projecting downward from the boat hull, the centerboard disposed essentially below the mast.

12. The sailboat as defined by claim 5, wherein the sail means comprises a symmetrical sail and a frame for the sail, the frame being rotatable on the mast.

13. The sailboat as defined by claim 5, and further comprising means for limiting movement of the sail in a given direction.

14. The sailboat as defined by claim 5, wherein the mast, sail means and the sensing and positioning means are disposed on the aft portion of the boat.

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