Dec. 3, 1963 LE ROY MALROSE 3,112,725

SAILBOAT

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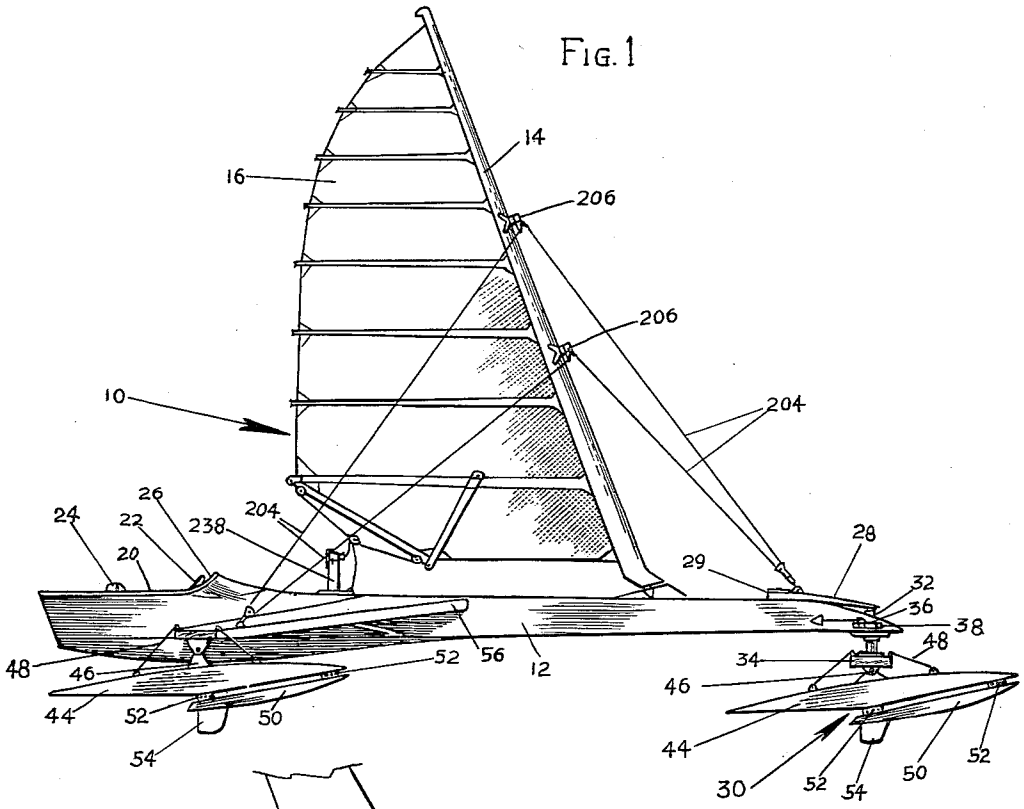
FIG. 1



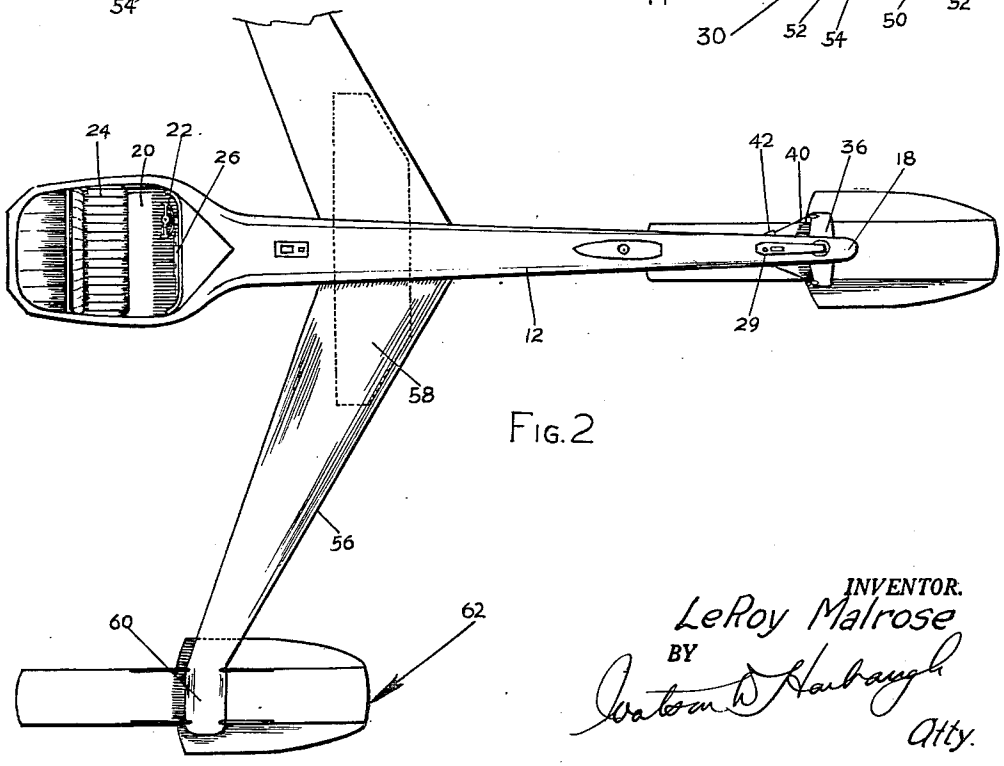


FIG. 2

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SAILBOAT

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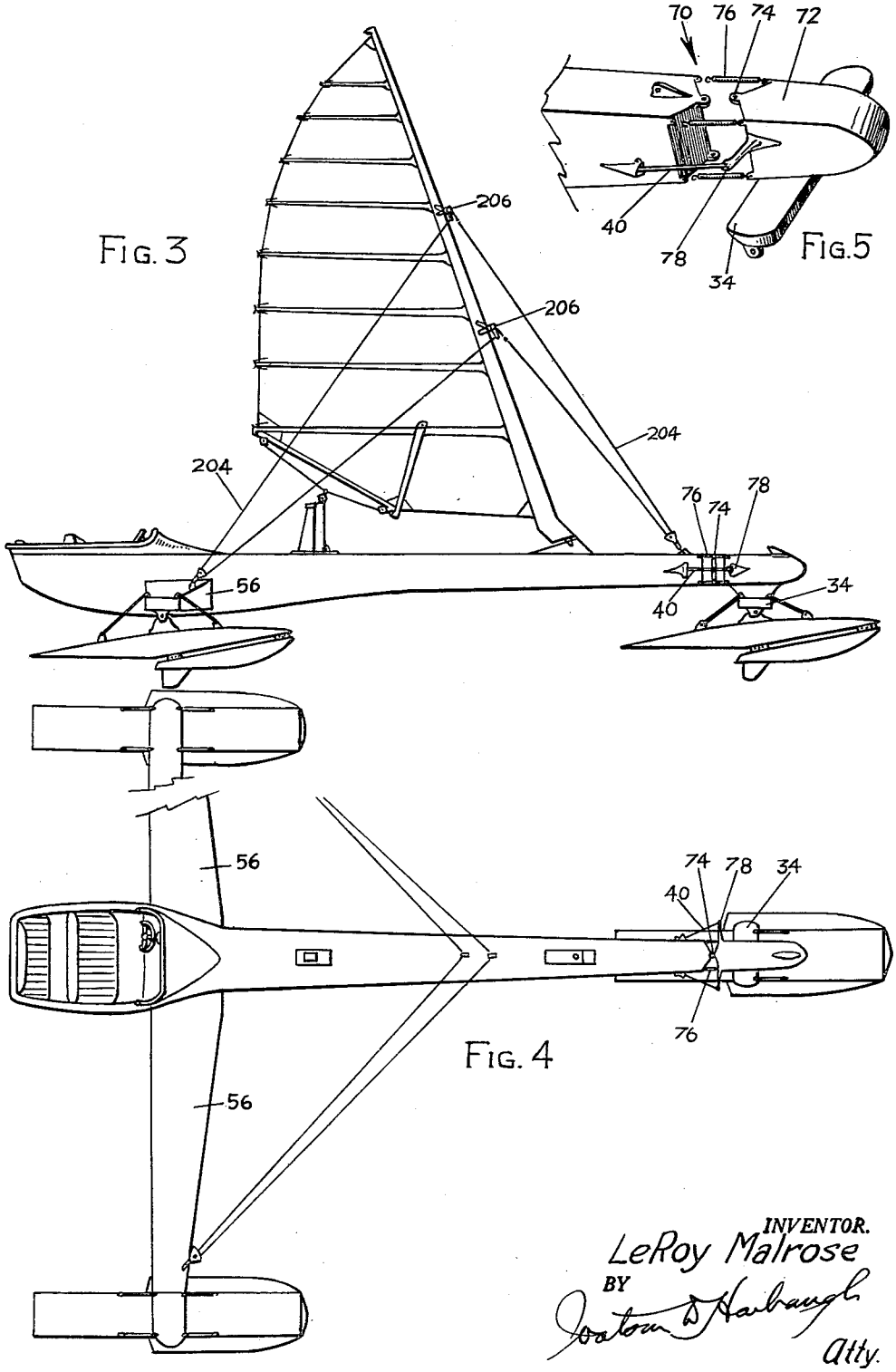

FIG. 3

FIG. 5

FIG. 4

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SAILBOAT

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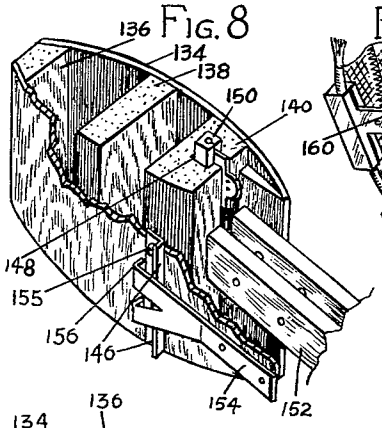

FIG. 8

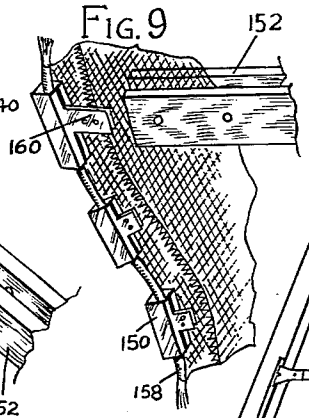

FIG. 9

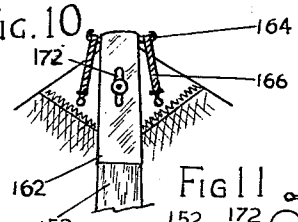

FIG. 10

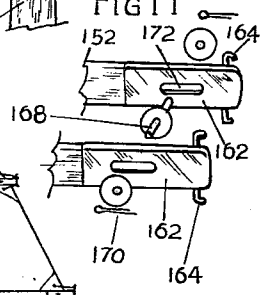

FIG 11

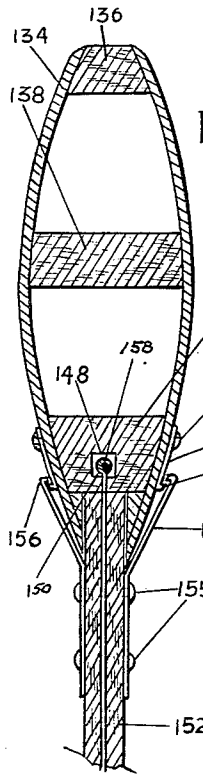

FIG. 7

FIG. 6

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FIG. 12

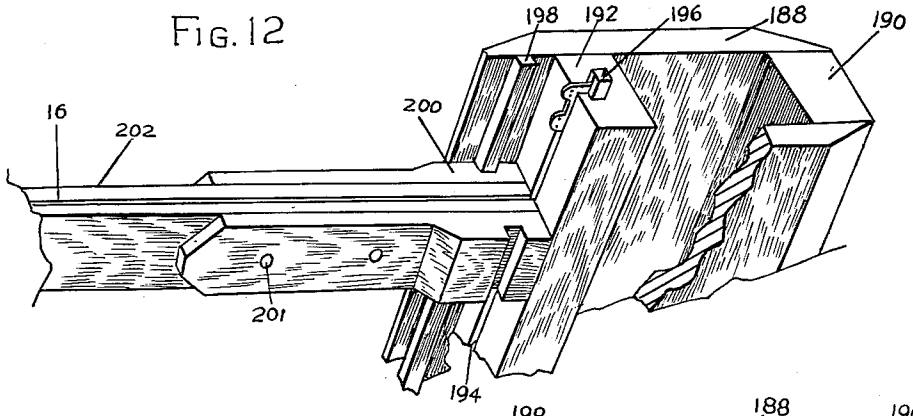


FIG. 13

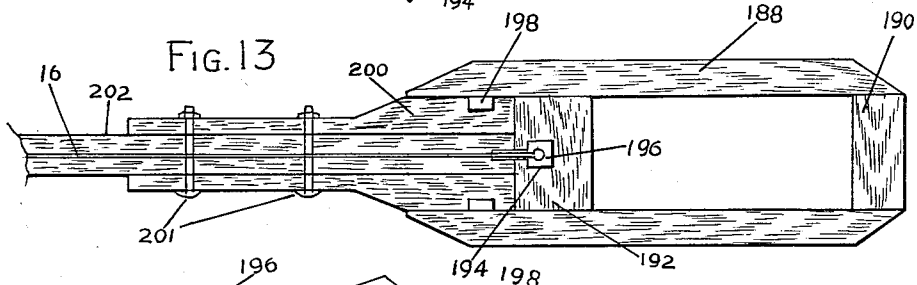


FIG. 14

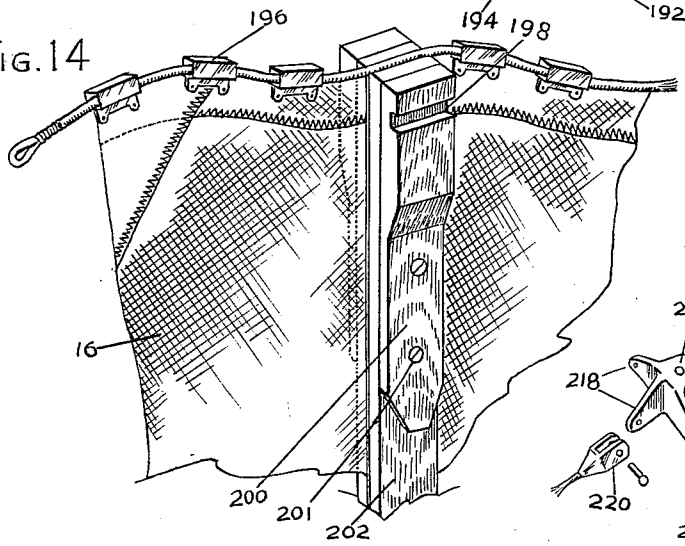
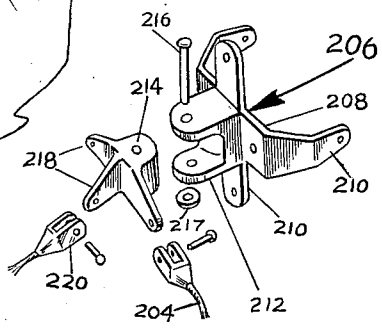


FIG. 15



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SAILBOAT

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FIG. 16

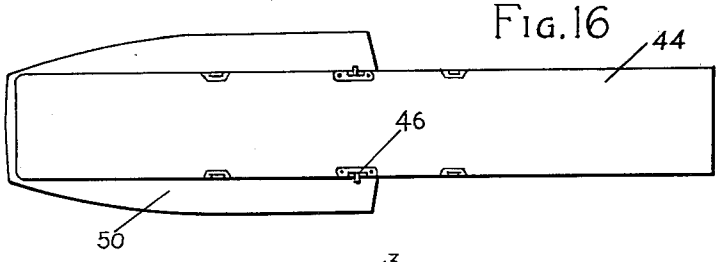
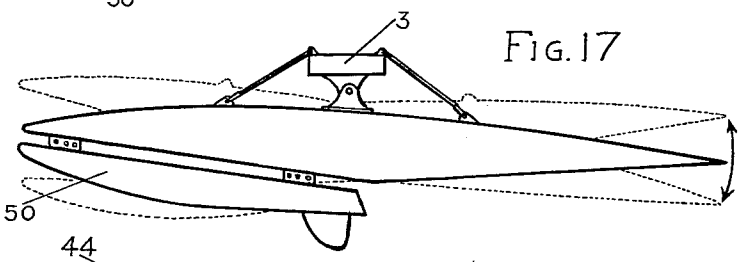


FIG. 17



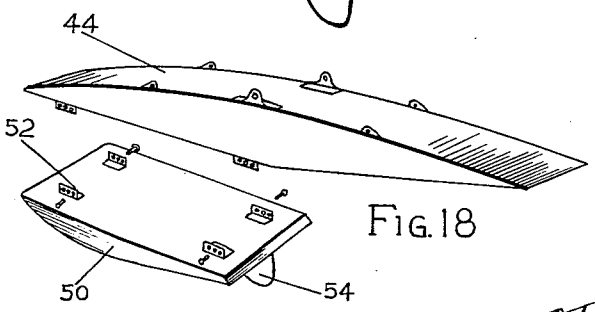


FIG. 18

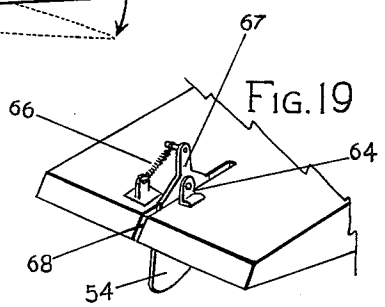


FIG. 19

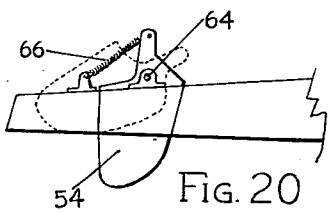


FIG. 20

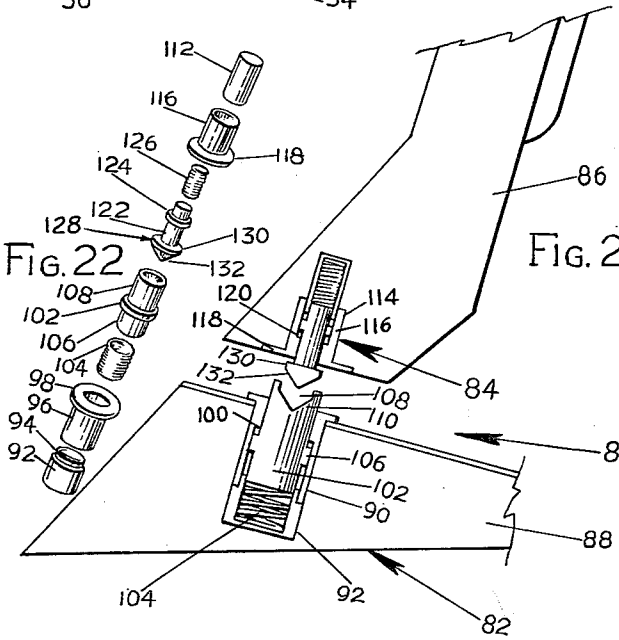


FIG. 22

FIG. 21

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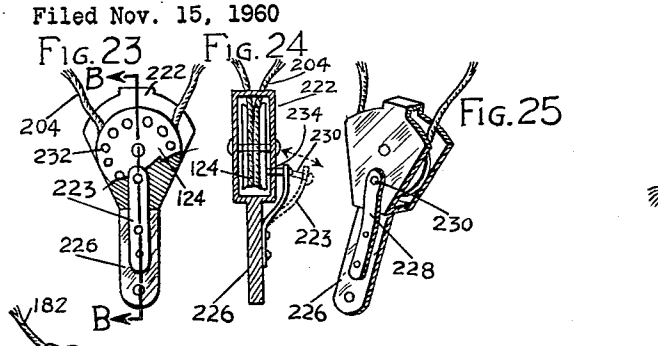

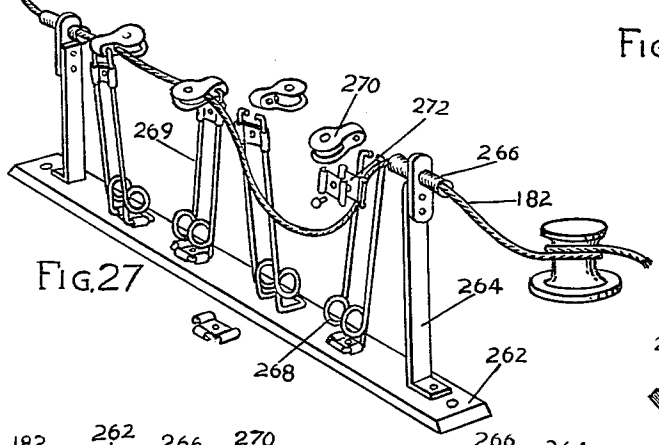

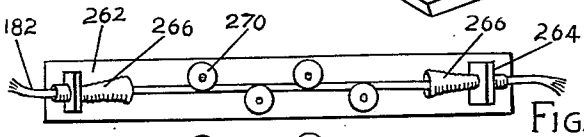

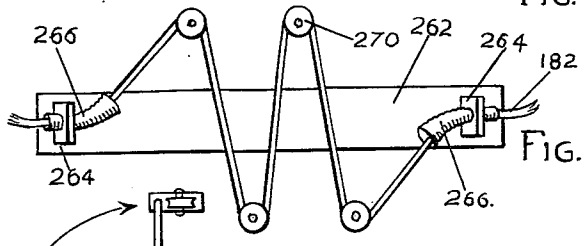

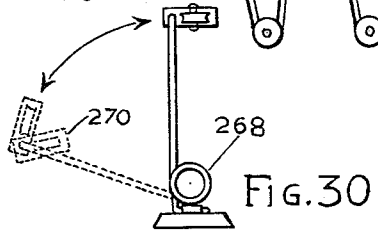

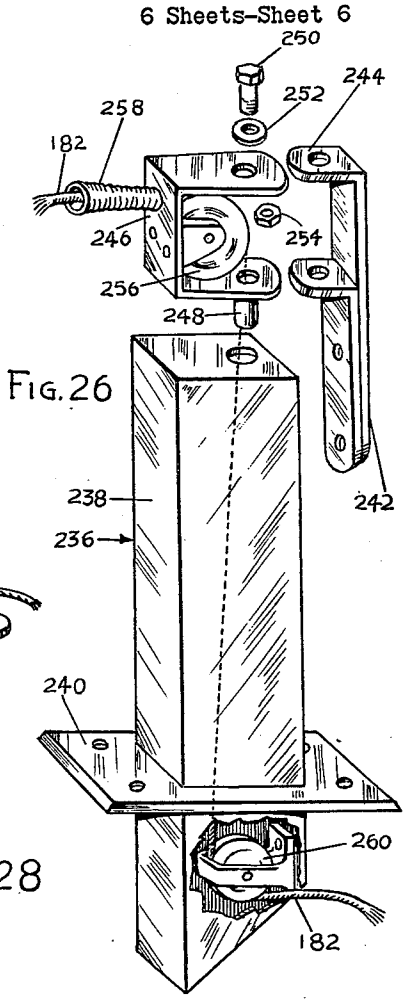

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United States Patent Office 3,112,725 Patented Dec. 3, 1963

3,112,725

SAILBOAT

Le Roy Malrose, 5312 Parker Ave., Chicago, Ill.

Filed Nov. 15, 1960, Ser. No. 69,464
15 Claims. (Cl. 114—39)

This invention relates in general to marine craft and more particularly to the species of marine craft known as sailboats. For generations, there has been a continuous attempt to provide a boat having structure and design that would glide along the water surface similar to the action of a power speed boat, would hold steady to the wind at all angles and eliminate the ever present problem of tipping. Several unsuccessful attempts have been made to attain these desired features, the majority of which have been limited to weighting the keel, shifting the cargoes or shifting the center of pressure of the sail or keel.

Referring now specifically to the racing sailboat where this invention finds its greatest utility, there has also been many devices and structures built in an attempt to obtain maximum hull speed of the craft from the prevailing wind conditions. The ideal or theoretical structure being of course to eliminate the frictional drag or water displacement between the boat and the water and to derive maximum force at all times from the prevailing winds. Maximum hull speed is not attained by conventional sailboats of today since it is necessary to permit the sail to yield and allow the air to spill out the upper portions of the sail to prevent the boat from heeling. In an effort to prevent heeling or tipping and to derive a greater force from the wind by not permitting the air to spill out at the upper portions of the sail, attempts have been made to weight the keel or provide shifting weights within the hull. As weight was added, the water displacement of the boat increased which in turn decreased the velocity. Over the years, there has been a continual struggle in balancing these two primaries, water displacement and sail force, in an attempt to attain maximum hull speed from the prevailing wind conditions at all times.

It is therefore the primary object of this invention to provide an improved sailboat which eliminates the disadvantages and problems of the conventional sailboats and substantially attain the maximum theoretical hull speed possible from the wind at all times.

A specific object of this invention is to provide an improved sailboat which has an elongated hull elevated above the water with three support floats providing minimum water displacement.

Another object of this invention is to provide an improved sailboat presenting a sail section that has horizontal semi-flexible reinforcing ribs spaced across the entire area thereof to minimize the amount of billowing of the sail but still derive maximum force from the prevailing wind.

Another object of this invention is to provide an improved sailboat whereby the sail is secured to the mast by a sliding track which permits the sail to be repositioned in a vertical direction along the mast.

A further object of this invention is to provide an improved sailboat having a pivotal shock-absorbing safety release securing mechanism for joining a mast to a hull.

Another object of this invention is to provide an improved sailboat having a float section resiliently mounted in the front of the boat for pivotal rotation to affect directional changes of the boat.

A still further object of this invention is to provide an improved sailboat having float assemblies resiliently secured in proper attitude to present a minimum of water displacement even as the floats leave the water and reenter.

A further object of this invention is to provide an improved sailboat having a unique control arrangement whereby directional changes are brought about by the pilot operating only a steering wheel. The sail section automatically repositioning to derive maximum hull speed from the prevailing winds.

A still further object of this invention is to provide an improved sail boat having a plurality of pivotal guy wire tension equalizers coordinated with three-way hinge assemblies to maintain the mast in the desired position.

Another object of this invention is to provide an improved sailboat having a line gathering mechanism and traveler which eliminates any line fouling and the requirement of a boom.

A further object of this invention is to provide an improved sailboat having a directional fin on the lower surface of the float assemblies which are resiliently displaced within the float assembly when striking a foreign object.

A further object of this invention is to provide an improved sailboat having a float assembly with an adjustable and replaceable lower member to compensate for varied weight and weather conditions.

Another object of this invention is to provide an improved sailboat of unique design and structure which is rugged in construction, shock-resistant and substantially automatic in operation.

With these and other objects in view which will become apparent in the following detailed description, the present invention will be further understood in connection with the following drawings, in which:

FIG. 1 is a view in side elevation of the sailboat of this invention;

FIG. 2 is a fragmentary top plan view of the sailboat of of this invention;

FIG. 3 is a view in side elevation of another embodiment of the sailboat of this invention;

FIG. 4 is a fragmentary top plan view of the embodiment illustrated in FIG. 3;

FIG. 5 is a fragmentary perspective view of a forward steering assembly of the embodiment illustrated in FIG. 3;

FIG. 6 is a view in side elevation illustrating the relationship of the mast, the sail and component parts thereof;

FIG. 7 is a cross-sectional view of the mast taken along the line A—A of FIG. 6 and illustrates the sliding retention of the sail thereto;

FIG. 8 is a partially cut-away perspective view of the cross-sectional area shown in FIG. 7;

FIG. 9 is a fragmentary perspective view of the joining of the sail with runner members for reciprocating movement within the mast;

FIG. 10 is a fragmentary view in side elevation of a rib tip with the sail resiliently retained thereto;

FIG. 11 is a fragmentary exploded perspective view of the holding members of the rib tip shown in FIG. 10;

FIG. 12 is a fragmentary partially cut away perspective view of another embodiment of this invention illustrating the reciprocating relationship of the sail to the mast;

FIG. 13 is a fragmentary top plan view of the embodiment illustrated in FIG. 12;

FIG. 14 is a fragmentary perspective view illustrating the securing of the sail by the ribs with the runners secured thereto for engagement with the mast shown in FIG. 12;

FIG. 15 is an exploded view in perspective of a sail hinge to be mounted on the mast;

FIG. 16 is a top plan view of a float of this invention;

FIG. 17 is a view in side elevation of the float of FIG. 16 with alternate pivotal positions illustrated by dashed lines;

FIG. 18 is an exploded view in perspective of the float illustrated in FIG. 16;

FIG. 19 is a fragmentary perspective view of the lower float assembly illustrated in FIG. 17 showing another embodiment of a directional fin member;

FIG. 20 is a fragmentary view in side elevation of the embodiment illustrated in FIG. 19 with the alternate position of the directional fin shown by dashed lines;

FIG. 21 is a fragmentary partially cut-away view in side elevation of a base assembly in near coupling relationship with the mast of this invention;

FIG. 22 is an exploded view in perspective of the mating component parts of the base assembly and the mast as illustrated in FIG. 21;

FIG. 23 is a partially cut-away view in side elevation of a cable tension equalizer mounted on the sailboat of this invention;

FIG. 24 is a cross-sectional view of the cable tension equalizer taken along the line B—B of FIG. 23;

FIG. 25 is a perspective view of the cable tension equalizer;

FIG. 26 is an exploded partially cut-away view in perspective of a sail control column utilized on the sailboat of this invention;

FIG. 27 is a perspective view of a sail line gathering fixture mounted within the hull of the sailboat;

FIG. 28 is a top plan view of the gathering fixture illustrated in FIG. 27 in a position when there is a strong pull on the sail line;

FIG. 29 is a top plan view of the gathering fixture illustrated in FIG. 27 in position when there is slack on the sail line; and

FIG. 30 is a view in side elevation of a spring unit of the fixture illustrated in FIG. 27 with alternate positions shown by dashed lines to illustrate the action of the fixture.

By way of generalization for a better understanding of the detailed description to follow, the sailboat of this invention is characterized by the unique design, construction and arrangement of its several component parts to attain maximum velocity from the prevailing wind. The sailboat provides a narrow elongated hull with a cockpit positioned in the stern and a front center float assembly aft with a rear float assembly parallel to, but spaced outwardly, from the cockpit on both sides of the hull and secured thereto by reinforced spreader arms. The mast is pivotally secured to the hull and provides reciprocating retention of a sail which is automatically positioned by the direction and force of the wind relative to the directional movement of the boat. The sailboat is further characterized by a novel control mechanism for repositioning the front float assembly which is operable from within the cockpit whenever directional changes are desired.

Referring now to the drawings, FIGS. 1 and 2 illustrate a sailboat of this invention of the racing type, designated generally by the numeral **10** having a hull section **12**, a mast section **14** and sail section **16**. The hull section **12** is preferably formed from a fiber glass or wood or combination thereof by any conventional method and is elongated in shape with tapering sides extending backwardly from a downwardly sloping rounded forward portion **18**, to a cockpit **20** as best illustrated in FIG. 2. The cockpit, enlarged for receipt of a pilot, provides a steering wheel **22**, seats **24** and a dashboard **26** for mounting any desired instrumentation. The external contour of the cockpit is smoothly blended with the external surface of the hull in streamline fashion to afford as little wind resistant surface as possible.

A leaf spring **28** has one end thereof rigidly secured to the upper surface of the hull at a point **29** adjacent to but spaced back from the rounded forward portion **18** in such a manner that the free end of the spring extends outwardly over the forward portion as best seen in FIG. 1. A front float section, indicated generally by the numeral **30**, is mounted for vertical reciprocation and horizontal rotation relative to the horizontal plane of the boat. A bolt **32** passes vertically upwards through the hull with its uppermost end in physical contact with the extended leaf spring **28** and the other end of the bolt is secured to a forward spreader arm assembly **34**. A turning bar **36**, secured to the bolt **32** by a key and keyway arrangement for vertical movement of the bolt, extends outwardly on both sides of the hull through slots **38** formed therein. Steering cables **40** are secured to the extremities of the turning bar **36** and pass rearwardly through guides **42**, into the internal portion of the hull and connects with a steering arrangement controlled by the steering wheel **22**.

Referring now more specifically to FIGS. 1, 2, 16, 17 and 18, an upper float section **44** of the front float assembly **30** is pivotally secured to a lower surface of the spreader arm **34** by a pivot fixture **46** and is retained in the proper attitude by a pair of shock cords **48** secured at one end to the spreader arm and at the other end to the upper surface of the float. The shock cords are under sufficient tension at all times to balance the float and hold it in the correct attitude if it leaves the water. This prevents the float from digging into the water on re-entering and prevents over-action of the rocking movement of the float assembly. A lower float section **50** is secured in spaced relationship below the upper float section **44** by brackets **52** and provides a directional fin **54** depending at its rearward extremity. The arrangement of the lower float section relative to the upper float section is such that the depending directional fin is in direct alignment below the pivot fixture **46** and the bolt **32** as best seen in FIG. 1. From the foregoing description, it is readily apparent that the front float assembly **30** provides a completely resilient shock absorbing system for directional control of the sailboat.

Still referring to FIGS. 1, 2, 16, 17 and 18, a downwardly extending swept back spreader arm **56** is secured to both sides of the hull near its upper surface and are spaced slightly forward of the cockpit **20**. A reinforcing strut **58**, illustrated by the dashed lines in FIG. 2, passes through the hull and extends outwardly therefrom inside each of the spreader arms to provide additional rigidity to the structure. The outward extremity of each spreader arm has an angular portion **60**, which forms a right angle to a line extending through the length of the hull, to which is resiliently secured a rear float assembly **62**. The structure and arrangement of the rear float assemblies **62** is substantially the same as the front float assembly **30** except for the vertical resilient movement and the rotary movement for steering, but does provide an upper float section **44** pivotally secured to a lower surface of the angular end portion **60** of the spreader arm, shock cords **48** extending from the upper surface of the upper float section to the end portion **60**, a lower float section **50** secured in spaced relationship below the upper float section **44** by the brackets **52** with a depending directional fin **54** at its rearward extremity in direct alignment below the pivotal fixture **46**. The pivotal action of the float asemblies is best seen in FIG. 17 and is illustrated by the dashed lines showing the possible extreme alternate positions. The brackets **52** on the lower surface of the upper float section and the upper surface of the lower float section of both the front and rear float assemblies are provided with a plurality of openings which permits the position of the lower float sections to be altered relative to the upper float sections thus enabling the float to ride higher or lower in the water as one desires. Also, this feature permits a variety of different lower float sections to be interchanged to compensate for different sailing conditions such as using a large lower float section to accommodate the carrying of more weight or the use of a smaller lower section for speed when racing.

Referring now to FIGS. 19 and 20 specifically, an alternate embodiment of the directional fin **54** is illustrated and is adapted for vertical pivoting to prevent damage to the fin when beaching the boat. The fin is pivotally secured in the lower float section **50** by a pin and bracket arrange-

ment 64 secured to the upper surface of the float and is resiliently held in the downward position by a tension spring 66. One end of the spring 66 being secured to an upward extending portion 67 of the fin and the other end secured to the upper surface of the float. A slot 68 is formed in the rear portion of the lower float sections to receive the fin when in the up position as illustrated by the dashed lines in FIG. 20. It is now readily apparent that the sailboat of this invention provides a unique three point surface for contact with the water which readily absorbs all wave shocks, repositions automatically on water surface changes to present the least amount of surface contact to reduce frictional drag, may be readily altered to suit sailing conditions and provides the necessary buoyancy to maintain the boat on the surface of the water.

Referring now to FIGS. 3, 4 and 5 an alternate embodiment of the steering assembly and the rear spreader arms is illustrated. The rear spreader arms 56 have a more straight design and join the hull near the lower surface thereof with a reinforcing strut, similar to strut 58 of the preferred embodiment previously described, which is utilized to add rigidity to the construction but is not illustrated in the drawings. The steering assembly of this embodiment indicated generally by the numeral 70, provides for a forwardmost portion of the hull 72 to be pivotally secured to the hull by a hinge 74 and is maintained in alignment by four tension springs 76 secured at one end to the four corners of the hull and the other to the opposing corners on the forward portion 72. A steering or turning bar 78 is secured on each side of the forward portion 72 and extends outwardly therefrom to which a steering cable 40 is secured. A spreader arm assembly 34 is secured to the lower surface of the forward hull portion to which a float assembly is pivotally secured as previously described for the other embodiment. The four tension springs provide equal tension on the foremost hull portion 72 thus keeping it in a neutral position until the steering assembly is repositioned by actuation of the steering wheel.

Referring more specifically to FIGS. 21 and 22, a releasable shock-absorbing base mounting assembly 80 for securing the mast to the hull is illustrated and provides a footing section 82 secured to the hull and an upper connector section 84 secured in the lower end portion 86 of the mast 14. The footing section 82 comprises an angular base plate 88 which is rigidly secured to the upper surface of the hull as best seen in FIGS. 1 and 3. An opening 90 is recessed in the upper surface of the base plate for receipt of a lower portion of the connector consisting of a lower cylinder 92 provided with an external shoulder 94 on which an upper cylinder 96 is received. The upper cylinder 96 has a flange 98 extending outwardly therefrom at its upper extremity which seats on the upper surface of the base plate when in the assembled position and provides an internal shoulder 100 near the upper extremity to serve as a travel limit stop for a connector member 102 mounted therein which is urged in an upward direction by a compression spring 104. The spring 104 has one end seat on the bottom of the lower cylinder 92 and the other end on the lower surface of the connector member 102. The connector member 102 has a land 106 on its cylindrical surface which makes physical contact with the shoulder 100 when the member 102 is in the extreme upward position and contacts the upper surface of the lower cylinder 92 when in the extreme downward position. The upper extremity of the connector member 102 has a cylindrical recess 108 formed therein which terminates in a smooth conical surface 110 for mating receipt with the upper connector section 84 embedded in the lower end surface of the mast.

The upper connector section 84 provides an upper cylinder portion 112 received in an opening 114 in the end of the mast 14 to which a lower cylinder portion 116 is threadably secured. Cylinder portion 116 has a flange portion 118 which extends outwardly therefrom at its lower extremity and seats on the lower surface of the mast when the two cylinder portions are threadably engaged. A shoulder 120, formed internally on the cylinder portion 116, provides a travel limit stop for a connector member 122. A land 124, integrally formed on the cylindrical surface of the connector member 122, engages the shoulder 120 in movement in one direction of the connection member and engages the lower surface of the upper cylinder portion 112 in the other direction. A compression spring 126 is disposed between the upper surface of the connector member 122 and the under surface of the upper cylinder portion 112 to continually urge the connector member in a downward mating direction. A tip 128 is formed on the lower end of the connector member 122 and provides a round upper portion 130 terminating in a conical surface 132 for engagement with the recess 108 in the end of the connector member 102. The connecting arrangement, which is a safety catch bearing in form, retains the mast in place but permits it to move up and down to cushion the shock of the waves in rough weather. The safety factor being that if any or all of the guy wires should break, all of the mast and sail will detach instead of breaking and causing possible injury to the boat or the pilot. This relationship will be more fully understandable as the description continues.

Referring now in general to FIGS. 6, 7, 8, 9, 10 and 11, a preferred embodiment of the sail, mast and connecting members therefor is illustrated. The mast 14, being pivotally secured at its base to the hull, as just explained, extend upwardly at an angle less than 90° relative to a horizontal plane of the hull and provides guide members for securing the sail section 16 thereto. Referring specifically to FIG. 7, a cross-sectional view is shown illustrating the construction of the mast which has a shell 134, preferably formed from wood or fiberglass, secured in spaced relationship by spars 136, 138 and 140. The contour of the mast being substantially elliptical to insure sufficient mass for strength and rigidity in addition to providing a streamline shape to reduce wind resistance. Guide members 142 are secured on the external surface of the shell on both sides of the mast at the rearward edge thereof by a plurality of bolts 144 passing through the spar 140. The guides extend substantially the entire length up the mast and provide a lip portion 146 to interlock in sliding relationship with a hook member secured to the sail section to be explained. A T-shaped channel 148 is formed in the rearward edge of spar 140 and extends substantially the entire length thereof for receipt of a plurality of runners 150 secured to the sail section 16 as best seen in FIGS. 8 and 9.

A plurality of equally spaced horizontal sail ribs 152, extend across the sail 16 on both sides thereof to clamp the sail therebetween whereby a straight, tight sail is maintained at all times. The sail ribs have hook members 154 secured adjacent the mast end by bolts 155 passing through the ribs. The hook members, preferably formed from a resilient, non-corrosive metal, extend outwardly and provide a lip portion 156 for engagement with the lip 146 on the guide members 142. The resiliency of the metal maintains the lip portions in positive engagement. The mast end of the sail ribs secures the runners 150 therebetween and has its outermost extremity abutting the spar 140 as best seen in FIGS. 7 and 8. Referring now to FIG. 9, each of the track runners 150 provides a cylindrical opening therethrough which receives a reinforced edge 158 of the sail. Outwardly extending arms 160 clamp the sail into position and if a runner when positioned in channel 148 is in alignment with a sail rib, they are in turn secured therebetween. From the foregoing specification, it is readily apparent that the unique arrangement and cooperation of the interlocking lips 146—156 and the channel 148 and runners 150 provides not only a securing of the sail to the mast, but readily permits the movement of the sail up and down the length of the mast.

Referring now to FIGS. 10 and 11, the other end of the sail ribs 152 are illustrated as having slotted tips 162, preferably formed from aluminum, for resiliently securing the sail in position. Hooks 164 extend outwardly from the outer extremity of each tip for receipt of an elastic member, such as a spring 166, which has its other end secured to the sail. A pin 168, held in position by cotter pins 170, passes through slots 172 which in conjunction with the springs resiliently secure the sail in position.

A traveler 174, made up of a fixture 176 having metallic ends 175 is secured at one end to the lowermost sail rib and provides a removable pin or ring 178 at it other end for disengagement of a pulley 180, which is in turn interconnected to a sail line 182 by a cable 184 and a pulley 186 which is in like manner removably secured by a ring 178 to the outermost tip of the lowermost sail rib. The sail line 182 passes around a pulley 187 which is anchored to the cable 184. Thus, it is easily understood that as the angular position of the sail varies, the pulley 187 will be free to move since cable 184 provides a closed loop around pulleys 180 and 186. This arrangement completely eliminates the necessity of a boom required on conventional sailboat structures as will be readily apparent as the description continues.

Referring now to FIGS. 12, 13 and 14, another embodiment of reciprocating retention of the sail to the mast is illustrated. The mast provides an outer shell 188 separated by spars 190 and 192. The rearward edge of spar 192 is provided with a T-shaped channel 194, similar to the T-shaped channel 148 in spar 140 of the preferred embodiment, for receipt of a plurality of runners 196. A track guide 198 is formed on the rearward inner surface of each side of the shell on which a reinforcing rib bracket 200 engages therewith in sliding relationship. The bracket 200 is secured by a pair of bolts 201 to each side of a sail rib 202 to form a smooth end surface with the extremity of the sail rib to engage the spar 192 as the bracket engages the track 198. As previously described, the runners 196 secure the sail 16 in a position for reciprocation in the channel 194.

Referring now primarily to FIG. 15 and briefly to FIGS. 1 and 3, guy wires 204 interconnect from the hull and the extremities of the rear spreader arm to a hinge assembly 206 spaced on the mast which coordinates the tension in all of the guy wires to maintain the mast in the desirable semi-upright position. The hinge assembly provides a base plate 208 having securing projections 210 contoured to fixedly secure the hinge to the mast and two outwardly extending ear members 212 on the outer surface thereof for pivotal receipt of a holding member 214. A pin 216 retains the member 214 between the ear members 212 and has a washer 217 received on its lower extremity with a cotter pin, not shown in the drawing, used in conjunction with the pin and washer to secure the holding member in place at all times. The holding member 214 has three equally spaced projections 218 which receives the ends of guy wires 204 by means of a clevis and pin arrangement 220. The hinge assembly readily permits the coordination of all the movement of the hull and the extremities of the rear spreader arms to be transmitted and compensated for in maintaining the mast in the desired position.

Turning now specifically to FIGS. 23, 24 and 25, a cable tensioning equalizer is shown around which the guy wires 204 pass to maintain constant tension in the wires at all times. A housing 222 partially encloses and secures a pulley 224 for rotary movement about which a guy wire 204 is received. A securing member 226 extends downwardly from the lower surface of the housing to provide a means for attaching the equalizer assembly to the boat. A flat angular spring 228, riveted to the side of the securing member, has a spur 230 carried on the upper end thereof to be positioned in one of a plurality of openings 232 equally spaced adjacent the periphery of the pulley to prevent further rotation thereof. An opening 234 in the side of the housing permits the engagement of the spur with the openings 232, in the pulley with the spring force holding the spur in positive engagement with the pulley at all times during operation of the boat. The cable tension equalizer fixture completely removes the guess work of keeping cables or guy wires with equal tension and when used in connection with the hinge assembly 206, previously described, also keeps the mast in the desired position. Referring now to FIGS. 1 and 3, the guy wires are attached to the upper hinge assembly 206, passed down to pulley 224, wrapped twice around the pulley and back to the lower hinge assembly. By lifting the spur and disengaging the pulley, the cables will immediately equalize in tension and by return of the spur into the closest hole or opening on the pulley in alignment therewith, the cables are locked in position and will maintain the constant tension that is desired.

Referring now to FIG. 26, a control column assembly 236 is illustrated and provides a housing 238, preferably formed from aluminum and having a square or oblong external contour, which extends upwardly from the deck to a height to clear the movement of the sail and extends substantially below the deck to pass the sail line 182 to control fixtures mounted in the hull. A footing 240 is integral with the housing which permits securing of the control column assembly to the deck. An elongated bracket 242, having a pair of spaced ears 244 on the upper end thereof, is secured to the rearward side of the column housing. A guide member 246 pivots between the ears 244 and is secured therein by a downward extending hollow pin 248 extending through the lower ear 244 and into the housing 238 and the other end of the guide member is secured by a bolt 250 passing downwardly through a washer 252, upper ear 244 and the guide member with a nut 254 engaging the end of the bolt to secure the members in pivotal relationship. A pulley assembly 256 is rigidly secured on the inner surface of the guide member 246 with a leader 258 secured on the outer surface. A lower pulley assembly 260 is secured on the inner surface of the housing 238 adjacent the lowermost extremity thereof below the deck surface. Referring briefly to FIGS. 1 and 3, the sail line 182, having one end secured to the deck, passes upwardly around a pulley of the traveler and downward through the leader 258, around pulley 256, through the hollow pin 248, downwardly through the column housing, around pulley 260 and backwardly into a line gathering mechanism, next to be described. The arrangement of the pulley 260 in relation with the pulley 256 and the pivotal guide member 246, permits a smooth passage of the sail line at all times regardless of the sail position.

After the sail line passes around the lower pulley assemby 260, it extends into the hull and passes through a line gathering mechanism, as best seen in FIGS. 27, 28 and 29. The gathering mechanism provides a base plate 262 which is secured to a lower inner surface of the hull and has a bracket 264 secured thereto at each end to support a leader 266, similar to the leader 258 previously described, to guide the sail line into and away from the gathering mechanism. Intermediate the brackets 264 and secured to the base plate 262 are a plurality of springs 268 having elongated ends 269 to which a pulley assembly 270 is pivotally secured by means of a pair of clips 272, bolted together to hold the spring ends in contact therewith. Springs 268, when in the rest or neutral position are in the outward or down position illustrated in FIG. 29 and the dashed line of FIG. 30. In this position, the sail is substantially in center alignment with the hull with maximum slack of the sail line 182 being taken up by the gathering mechanism in its outward or rest position. FIG. 28 illustrates the action of the gathering mechanism when the sail is at its maximum outward position and requiring the entire sail line length. As the sail moves outwardly from the center position to either side of the boat, the springs 268 will increase in resistive

force to such movement until the maximum upright position, illustrated in FIG. 28, is attained.

From the gathering mechanism, the sail line extends rearwardly to a windlass, not shown in the drawings, which is operable by the pilot from within the cockpit. The repositioning of the sail line by the windlass will control the center and maximum outer positions of the sail since the gathering mechanism is capable of only collectively controlling a prescribed amount of sail line.

From the foregoing description, it is now readily apparent that the arrangement of the several parts of the controlling mechanism will permit complete movement of the sail in substantially any position without fouling of the line and permitting the pilot to reposition the steering mechanism for change of course with the sail section compensating for such change automatically without further adjustments or action by the pilot.

While certain novel features have been disclosed to illustrate how the objects and advantages of the invention are attained, and are further pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes may be made by those skilled in the art without departing from the spirit and scope of the invention.

What is claimed is:

1. A sailboat of the racing type comprising an elongated hull, a front float assembly pivotally secured to the hull, a rear float assembly secured on each side of the hull, a cockpit integrally formed with the extreme rearward portion of the hull, a mast, means resiliently supporting the mast for vertical movement and pivotally about an upright axis on the hull, a sail retained in sliding relationship with the mast, control means interconnecting said front float assembly with the cockpit to effect directional changes of the boat by a pilot and sail line control means interconnecting the sail with the cockpit to compensate for sail movement as it automatically repositions to derive maximum hull speed.

2. A sailboat of the racing type comprising an elongated hull having tapering sides extending from a rounded forward portion backwardly to an enlarged cockpit at the extreme end thereof, a front directional float assembly, a bolt assembly in conjunction with a leaf spring resiliently and rotationally securing the front float assembly to the forward portion of the hull, shock cords secured to the bolt assembly maintaining the float in proper attitude at all times, rear float assemblies spaced outwardly from, but parallel to the hull, said rear floats secured by downwardly sloping spreader arms rigidly attached to both sides of said hull, a mast releasably secured to the hull for pivotal and reciprocating movement therewith, guide members secured to the mast and extending substantially the entire length thereof, a sail, a plurality of reinforcing ribs horizontally spaced on both sides of the sail to secure the sail therebetween, a plurality of hook members secured to one end of said sail ribs to secure the sail in sliding relationship with the guide members on the mast, bracket members secured to the other end of said sail ribs to resiliently secure the outer edge of the sail in position, directional control means interconnecting the front float assembly with the cockpit to effect directional changes of the boat and sail line control means to compensate for slack sail line as the sail automatically repositions upon directional change of the boat to derive maximum hull speed.

3. The invention as set forth in claim 2 wherein said mast comprises an outer shell spaced apart by a plurality of spars, a T-shaped channel formed in the rearward edge of the rearmost spar for receipt of a plurality of sail retaining runners, said channel extending substantially the entire length of said spar and angularly formed guide members having an outwardly extending lip portion secured to the outer surface of the shell on both sides of the mast to retain a sail in sliding relationship therewith.

4. The invention as set forth in claim 2 wherein said mast comprises an outer shell spaced apart by a plurality of spars, a T-shaped channel formed in the rearward edge of the rearmost spar for receipt of a plurality of sail retaining runners, said channel extending substantially the entire length of said spar and track guides formed on the inner rearward surfaces of the shell to retain a sail in sliding relationship therewith.

5. The invention as set forth in claim 2 wherein the said front float assembly comprises an upper float section, a pivot bracket secured to the upper surface thereof for pivotal retention to a bolt assembly, a lower float section secured below said upper float section in spaced relationship by adjustable brackets therebetween and a directional fin rigidly secured to the lower surface of said lower float section.

6. The invention as set forth in claim 2 wherein said front float assembly comprises an upper float section, a pivot bracket secured to the upper surface thereof for pivotal retention to a bolt assembly, a lower float section secured in spaced relationship with said upper float section by a plurality of adjustable brackets therebetween and a directional fin resiliently mounted to the lower surface of the lower float section to recess therein upon contacting a solid foreign object.

7. A connecting mechanism in combination with a racing type sailboat for securing a mast to a hull comprising an upper connector section embedded in the end surface of the mast, a lower connector section secured to the hull including a spring resiliently supporting the mast, an upper and lower hinge assembly secured in spaced relationship on the mast, a plurality of tension equalizers secured to the boat and guy wires interconnecting said hinge assemblies and said tension equalizers to retain the upper connector section in mating relationship with the lower connector section to secure the mast to the hull in the desired attitude.

8. A sailboat of the racing type comprising a rear hull section, a front hull section, a hull hinge assembly pivotally securing the rear hull section to the front hull section, a mast resiliently and pivotally secured to said rear hull section, a sail retained in vertical sliding relationship with the mast, a cockpit integrally formed with the rear hull section, a front float section resiliently and pivotally secured to the front hull section, a pair of rear float sections, spreader arms secured adjacent the cockpit and extending outwardly therefrom on both sides of the rear hull section, said rear float sections pivotally secured to the outer extremity of said spreader arms in parallel relationship to the rear hull section, steering control means extending from the cockpit to the front float section, mast hinge assemblies secured in spaced relationship on the mast, tension equalizers secured to the outwardly extending spreader arms and adjacent the forward edge of the rear hull section, guy wires interconnecting the mast hinge assemblies and the tension equalizers to retain the mast in desired attitude with the hull, and sail line compensating means interconnected with the sail on the rear hull section to effectively control the sail line as the sail automatically repositions to derive maximum hull speed upon directional changes of the boat actuated by the steering control means from within the cockpit.

9. The invention as set forth in claim 8 wherein said mast comprises an outer shell spaced apart by a plurality of spars, a T-shaped channel formed in the rearward edge of the rearmost spar for receipt of a plurality of said retaining runners, said channel extending substantially the entire length of said spar and angularly formed guide members having an outwardly extending lip portion secured to the outer surface of the shell on both sides of the mast to retain a sail in sliding relationship.

10. The invention as set forth in claim 8 wherein said mast comprises an outer shell spaced apart by a plurality

of spars, a T-shaped channel formed in the rearward edge of the rearmost spar for receipt of a plurality of sail retaining runners, said channel extending substantially the entire length of said spar and track guides formed on the inner rearward surfaces of the shell to retain a sail in sliding relationship therewith.

11. The invention as set forth in claim 8 wherein the said front float assembly comprises an upper float section, a pivot bracket secured to the upper surface thereof for pivotal retention to a bolt assembly, a lower float section secured below said upper float section in spaced relationship by adjustable brackets therebetween and a directional fin rigidly secured to the lower surface of said lower float section.

12. The invention as set forth in claim 8 wherein said front float assembly comprises an upper float section, a pivot bracket secured to the upper surface thereof for pivotal retention to a bolt assembly, a lower float section secured in spaced relationship with said upper float section by a plurality of adjustable brackets therebetween and a directional fin resiliently mounted to the lower surface of the lower float section to recess therein upon contacting a solid foreign object.

13. The invention as set forth in claim 8 wherein said sail line compensating means comprises pulley members received on said line disposed at spaced points within the hull and means to engage adjacent pulleys in opposite directions lateral to the normal direction of the line as it extends from a windlass within the hull to the sail, said means imposing resilient tension to the sail line at all times as the sail automatically repositions to attain maximum hull speed within the sail operating range determined by the pilot and moved by operation of the windlass.

14. A connecting mechanism in combination with a racing type sailboat for securing a mast to a hull comprising an upper connector section embedded in the end surface of the mast, a lower connector section secured to the hull, an upper and lower hinge assembly secured in spaced relationship on the mast, a plurality of tension equalizers secured to the boat and guy wires interconnecting said hinge assemblies and said tension equalizers to retain the upper connector section in mating relationship with the lower connector section to secure the mast to the hull in the desired attitude, said upper connector section comprising an upper cylinder portion secured in the end of the mast having an externally threaded lower portion, a lower cylinder portion having an internally threaded upper portion, a flange extending radially outward from the lower end of said lower cylinder portion, said flange seating flush with the end surface of the mast when said lower cylinder portion threadably engaged the upper cylinder portion, said lower cylinder portion having an internal shoulder adjacent the lower end thereof, an upper cylindrical connector member housed within said upper lower cylinder portion, said upper connector member having a lower conical shaped end surface and a compression spring disposed between the upper end of the connector member and the upper cylinder portion to resiliently retain said upper connector member in mating relationship with a lower connector member secured to the hull.

15. A connecting mechanism in combination with a racing type sailboat for securing a mast to a hull comprising an upper connector section embedded in the end surface of the mast, a lower connector section secured to the hull, an upper and lower hinge assembly secured in spaced relationship on the mast, a plurality of tension equalizers secured to the boat and guy wires interconnecting said hinge assemblies and said tension equalizers to retain the upper connector section in mating relationship with the lower connector section to secure the mast to the hull in the desired attitude, said lower connector section comprising a footing secured to the hull, a lower cylinder portion having an external shoulder at its upper end recessed in said footing, an upper cylinder portion received in mating relationship with the shoulder of the lower cylinder portion, a flange extending radially outward at the upper end of the upper cylinder portion for engagement with the footing when engaged with the lower cylinder portion, said upper cylinder portion having an internal shoulder integrally formed adjacent the upper end thereof, a lower connector member housed within the upper and lower cylinder portions, said lower connector member having a conical recess formed in the upper end thereof and a compression spring disposed between the lower surface of the connector member and the lower cylinder portion to resiliently retain the lower connector member in mating relationship with the upper connector section embedded in the end surface of the mast.

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