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SAILS AND RIGGING OF BOATS

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Fig. 1.

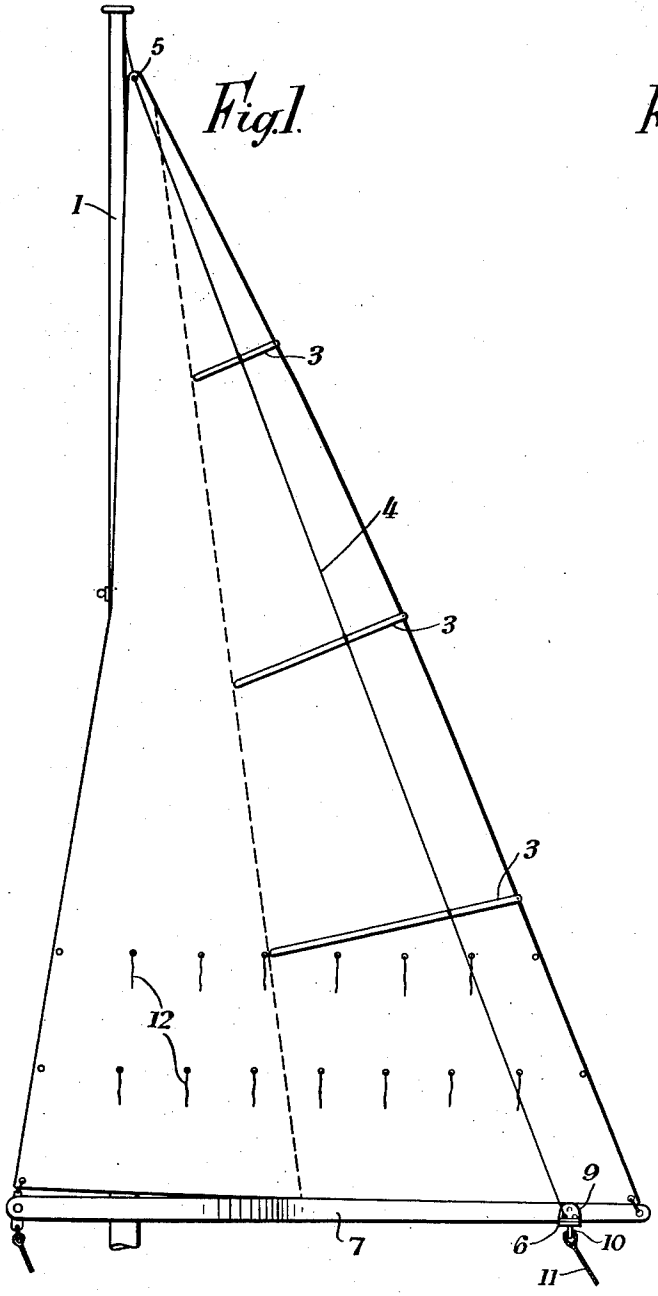
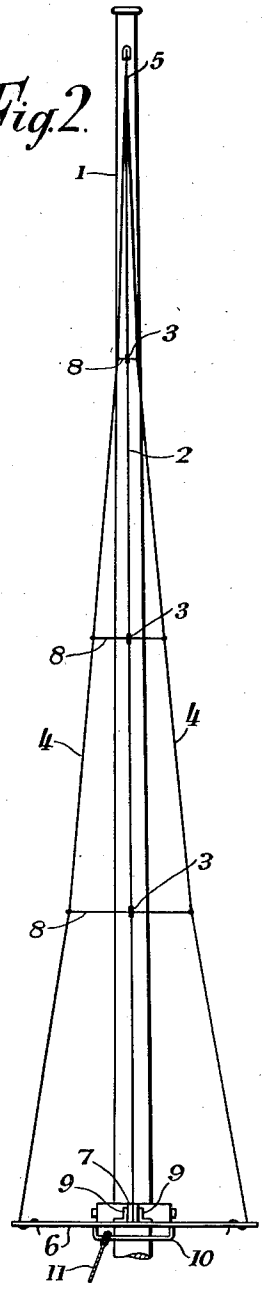


Fig. 2.



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BY Ross & Ross

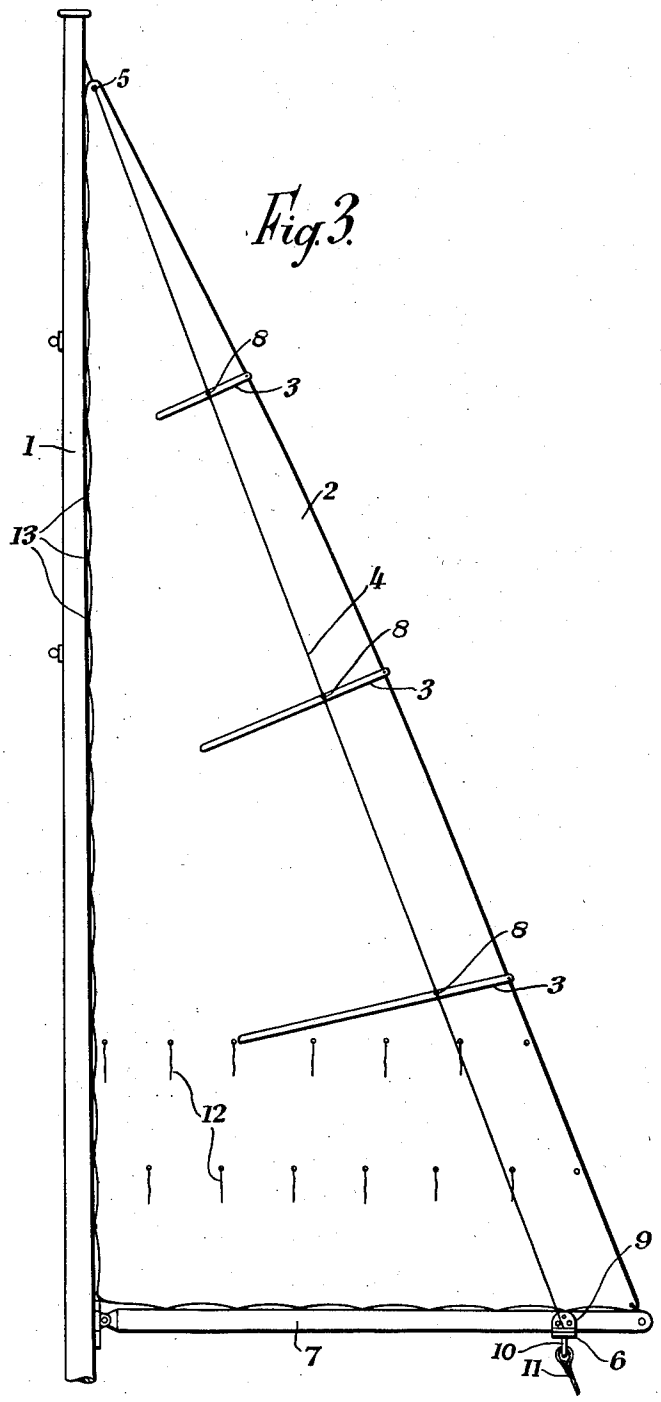
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Fig. 3.



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SAILS AND RIGGING OF BOATS

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5 Claims. (Cl. 114—102)

This invention relates to the sails and rigging of boats and more particularly to fore-and-aft sails, including gaff sails, as used for example on yachts. As now used, fore-and-aft sails, when in use, assume a natural twist under the pressure of the wind and, because of this, only a relatively small part of the sail is at the optimum angle to the wind pressure. In order that the upper part of the sail, or the gaff, may be brought into efficient use, it has hitherto been necessary to pull the boom and the lower part of the sail further to windward than would otherwise be the case and beyond what would be the optimum angle for the lower part of the sail. As a result, the efficiency of the sail as a whole is greatly reduced, since much of the sail is at the wrong angle to the wind pressure for the best results.

It is the object of the present invention to provide means for controlling, and more-or-less eliminating the said twist in a fore-and-aft said, thereby reducing the difference of angle between the upper and lower parts of the sail, and consequently bringing a larger part of the sail into a position of maximum efficiency.

According to this invention one or more controlling lines extending from spaced points in the height of the sail is or are attached to one or more out-riggers or the like on the boom, and means is provided whereby the strain from the main-sheet tackle, by which the position of the boom is limited relatively to the boat, may be proportioned between the sail itself and such of the said line or lines as is or are for the time being on the weather side of the sail.

Conveniently there is a single such controlling line at each side of the sail, connected to the sail by short tie-members at spaced points in the height of the sail, say at the points where the usual battens are inserted into the sail, and each such connection may comprise a single attachment only, or two or more attachments.

In some forms of the invention the means for taking the pull of the main-sheet tackle is stationary relatively to the boom, and includes means such as a sheet-horse whereby the said tackle may move from side to side of the boom, as the sail is moved over when the boat is changing tack.

According to another feature of the invention, the said out-riggers on the boom comprise a cross-tree, and a sheet horse the latter being of a length to determine the final position of the main sheet tackle when under wind pressure. Alternatively, there may be means for adjusting the outer limit of the main sheet tackle, so that the optimum position for any particular sail construction may be found by trial and error.

In the accompanying drawing:

Fig. 1 is a side view of a Bermuda sail incorporating one form of the present invention.

Fig. 2 is a rear view of the same, the sail being shown unstressed so far as wind pressure is concerned; and

Fig. 3 is a view corresponding to Fig. 1 but showing a known type of Bermuda sail.

Referring first to Figs. 1 and 2, in which there is a mast **1** and a main sail **2** with three battens **3**, inserted in pockets in known manner there is provided at each side of the said a control line **4** extending from a point **5** at the tip of the sail, and close to the sail, to the respective ends of a cross bar or cross-tree **6** comprising an out-rigger mounted on a boom **7**. At points where such con-

trol lines **4** cross or pass the respective battens **3**, they are connected to the sail by flexible tie members **8** such members being of progressively increasing length from the top of the sail downwards, that is to say, the tie members **8** near the top of the sail are shorter than those near the bottom of the sail. To prevent twisting of the battens, a loop is provided around each of them, and the tie members **8** attach to those loops. The said cross bar or cross-tree **6** is clamped across the boom.

Angle brackets **9** are employed (Fig. 2) to hold the cross-tree **6** in position. Suspended from the cross-tree, and passing below the boom, is a sheet-horse **10** to which the main-sheet tackle **11** is connected in a normal manner. The sail is secured at intervals **13** to runners sliding in a track on the mast in well known manner.

In use, with the boat sailing into the wind the boom moves to the leeward side of the boat, until the main-sheet tackle **11** reaches the windward end of the said sheet-horse **10**. In such a position, the control line **4** and tie members **8** on the lee-ward side of the sail hang loose whereas, on the wind-ward side of the sail, the line **4** and ties **8** are pulled taut by the pressure of the wind on the sail, and they operate to keep the sail substantially in a non-twisted diposition. Accordingly, the sail is presented to the wind at a relatively uniform angle over its whole length, and therefore has the maximum aero-dynamic effort. On changing tack, the boom swings over until the main-sheet tackle **11** meets the other end of the sheet-horse **10**, and the tie members **8** that previously were loose now become taut, and vice versa.

The length of the sheet horse **10** is such that, when the sail is under wind pressure, the strain from the tackle **11** is shared by the sail and the line **4** on the windward side, in proportions which cause the line **4** to pull on the sail, through the tie members **8**, so as to counteract any tendency for the sail to twist. To this end there may be adjustable stops on the sheet horse, to limit its effective length to any selected amount. Means other than the parts **10** and **11** may be employed for limiting the tacking movement of the boom.

It will be seen that as soon as the sail is slackened for reefing, the lines **4** and ties **8** will collapse, and will therefore offer no resistance to the reefing and stowing away of the sail. The ties **12** are provided in normal manner for securing the sail when reefed.

Whilst only one control line **4** is shown at each side of the sail, more than one may be provided when so desired.

What I claim is:

1. In a sail of the character described, a mast, a mainsail associated with said mast, a plurality of tie members attached to said mainsail and extending substantially at right angles therefrom, a cross tree extending transversely of and below said mainsail, a pair of control lines extending from the upper extremity of said sail to the opposite free ends of said cross tree, and connections between said tie members and control lines at their points of intersection.

2. A fore and aft sail comprising in combination, a mainsail, a controlling line extending from a point in the upper portion of the sail, a plurality of tie members attached to said mainsail and extending substantially at right angles thereto, a main sheet tackle, and a connecting means for said main sheet tackle permitting movement thereof, said connecting means being joined to said controlling line and connecting means between said tie members and controlling line at their points of intersection.

3. In a sail of the character described a mast, a mainsail associated with said mast, a boom, an outrigger on said boom, a plurality of battens inserted in said mainsail, and control lines on opposite sides of said mainsail and extending between and connecting said battens with said outrigger.

4. In a sail of the character described, a mast, a mainsail associated with said mast, a plurality of battens engageable with said mainsail, a boom, an outrigger mounted on said boom, and a control line connecting said battens and said outrigger.

5. In a sail of the character described, a mast, a mainsail associated with said mast, a plurality of tie members

attached to said mainsail and extending substantially at right angles therefrom, an outrigger extending transversely of and below said mainsail, control lines extending from the upper portion of said sail to each of the opposite free ends of said outrigger, and connections between said tie members and control lines at their points of intersection.

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