



# UNITED STATES PATENT OFFICE.

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## SAILBOAT-RIGGING.

1,375,400.

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*To all whom it may concern:*

Be it known that I, FREDRIK LJUNGSTRÖM, chief engineer, subject of the King of Sweden, residing at Brevik, Lidingön, Sweden, have invented certain new and useful Improvements in Sailboat-Rigging, of which the following is a specification.

The present invention relates to a novel type of rigging for sailing vessels, which rigging is particularly applicable to sailboats of racing type.

The object of the invention is to provide a rigging with a reduced number of sails, and the invention consists therein that the mast is pivotally connected with the hull so that it may be brought in different positions forward and backward in the longitudinal direction of the vessel.

In the accompanying drawing, an embodiment of a boat provided with a rigging according to the invention is shown by way of example in Figure 1. Fig. 2 illustrates a modification. The sail-boat illustrated is provided with one sail only which is a gunter sail without a gaff.

On sailing a boat of the ordinary type having only a main sail or other aft-sail, the boat will luff nearer wind, if this is not prevented by the helmsman at the tiller. In such a case the boat will lie more or less heavily on the rudder, particularly when sailing in lateral winds, or near the wind, and, above all, when sailing close to the wind in rough weather.

In order to prevent this, the sail and the influence thereof on the boat are, according to the invention, displaced ahead by inclining the mast forwardly in the longitudinal direction of the boat. The center of gravity and the pressure centers of the sail are thus displaced forwardly.

Referring to the drawing, the mast 2 of the boat 1 which carries the sail 3 is so connected with the boat that it may, on sailing, be inclined together with the sail either ahead or astern in the longitudinal direction of the boat. The mast 2 is provided with one or more fore- and backstays, 4 and 5 respectively, passing each over a roller 6 and 7 respectively to a rolling device, a windlass or the like 8 so devised that the one stay or group of stays is rolled onto a drum, simultaneously as the other stay or group of stays is rolled off a second drum.

When there are a number of stays em-

ployed afore or aft, each stay preferably has its own drum. As shown in Fig. 2 each forestay 4<sup>a</sup>, 4<sup>b</sup> and 4<sup>c</sup> is wound on a separate drum 8<sup>a</sup>, 8<sup>b</sup> and 8<sup>c</sup>, respectively, while the backstay 5 is wound on a drum 19, said drums having such diameters that the proper lengths of the fore- and backstays are hauled in or paid out so as to secure a good stretching of the stays. Preferably, the drums are arranged on the same shaft. To effect an adjustment of the tension of the stays, it is also possible so to combine for instance the fore stay or stays with a block-device 9, that the stay or stays may be shortened or lengthened by hauling in or paying out the one part of the block-device, as at 10. The windlass 8 may be provided with a crank attached directly thereto, and it may be disposed either in the cockpit of the boat in the proximity to the rudder, or a separate windlass 11 may be combined in the said place for instance with the group of stays running under deck. However, the windlass 11 may be reduced to a crank which is connected either mechanically or in some other convenient way with the windlass 8, so that the latter may be operated from the cockpit. The windlass 8 or 11 respectively is preferably provided with a worm.

The mast 2 is movably arranged in the deck 12 of the boat, for instance by being formed into a ball 13 where going through the deck, which latter is reinforced as shown in the drawing. Of course, a journal-movement may be used as well. Preferably, the lower end of the mast has attached thereto one or more rollers 14 running on a curved bar 15 extending in the longitudinal direction of the boat, the said bar together with the shrouds preventing the mast from moving athwartships. Obviously, the bar and the rollers may change places; moreover, it should be understood that any other suitable guiding device may be used instead of the one described.

By operating the windlass, the mast 2 may be inclined in the longitudinal direction of the boat, for instance toward the stem of it, whereby the pressure centers are displaced from 16 to 17. As will be seen from the drawing, a considerable area of the sail is moved toward the stem by only a slight angular displacement of the mast, and in this way the sail may, when sailing, be adjusted in accordance with the

force of the wind so as to relieve the rudder of most of its load. In fact, it will even be possible to sail without a rudder only by adjusting the position of the mast and the sail.

By arranging the mast according to the present invention, a boat may be sailed with one sail only, preferably an aft-sail corresponding to the ordinary main sail. Therefore, while maintaining the same area of the sail, this single sail may be taken larger than usual, or as large as the total area of the sails of the ordinary type of boat as heretofore used. For instance, when the sail area of a modern 30 square meter knock-about-cruiser is divided in two sails, a boat with a rigging according to the invention has only one sail with an area of 30 square meters. Evidently, the last-mentioned rigging becomes much higher, and consequently catches the different winds with greater ease. A further advantage is attained thereby that the mast may, and preferably should be placed more ahead, thus securing a larger clear space aft of the mast. Besides, the further advantage is obtained that the hoisting and the taking in of the sails is greatly facilitated by the omission of a fore-sail. The novel rigging also considerably facilitates the sailing of the boat, all bother about a fore-sail and a back stay in the form as heretofore employed being eliminated.

What I claim as new and desire to secure by Letters Patent of the United States is:—

1. A rigging for sail boats, characterized by the mast with the rigging being adjustable in the longitudinal direction of the boat, and provided with an operating device by means of which the mast may, when sailing, be caused to assume different slanting positions, in order to change the relative position of the pressure center of the wind on the sail.

2. A rigging as claimed in claim 1, characterized by this that the mast is connected with the stem and the stern of the boat by means of stays connected with a windlass in such a way that the mast may be brought in different slanting positions by turning a hand-wheel, a crank or the like.

3. An embodiment of a rigging according to claim 2, characterized by this that the fore stay and the back stay run over a roller arranged ahead and astern respectively, each stay running also over one of two or more drums connected with one another, said drums being preferably arranged on the same shaft, in order that on winding home the one stay or the one group of stays, while changing the position of the mast, the other stay or the other group of stays may be wound off its drum in a corresponding degree.

4. A rigging as claimed in claim 2, characterized by the provision of a plurality of fore stays, each of which is connected with a separate drum.

5. An embodiment of an arrangement according to claim 2, characterized by the windlass being so disposed as to be operated from the cockpit of the sail-boat.

6. An embodiment of a rigging according to claim 1, characterized by this that the mast is connected with the hull, preferably with the deck of the boat, by means of a socket-joint connection.

7. A rigging as claimed in claim 6, characterized by the lower end of the mast cooperating with the hull by means of a guiding device adapted to guide the mast relatively to the hull.

In testimony whereof I affix my signature in presence of two witnesses.

FREDRIK LJUNGSTRÖM.

Witnesses:

T. H. BERGROTH,  
SWEN SWENSSON.