June 6, 1967 Y. H. M. CRIOU 3,323,480

MAST COMPENSATING THE LIST OF SAILING-BOATS OF ALL CLASSES

Filed July 12, 1965 2 Sheets-Sheet 1

Fig. 1.

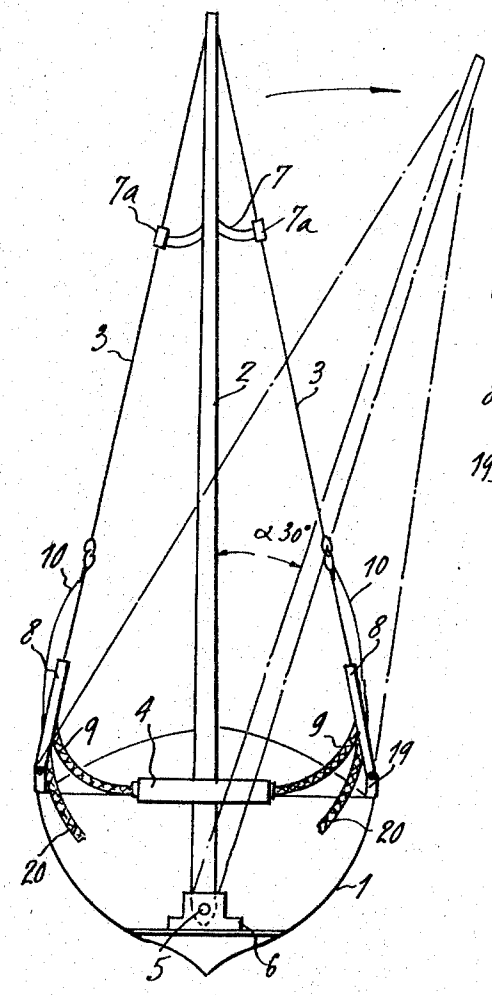
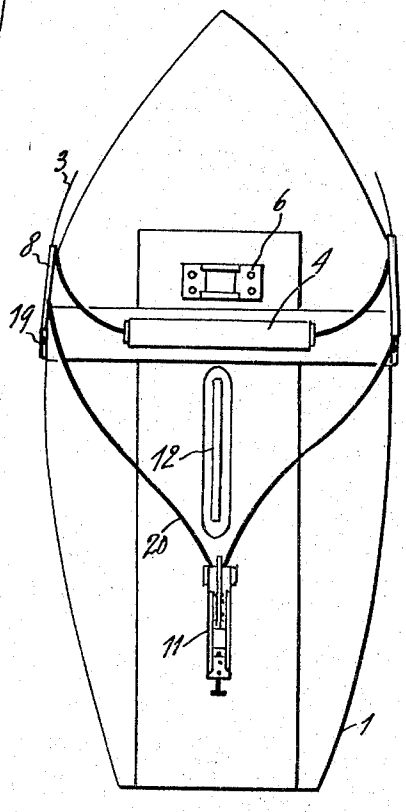


Fig. 2.



Inventor
Yves Henri Marie Criou
By Alvin Browdy
Attorney

June 6, 1967 Y. H. M. CRIOU 3,323,480

MAST COMPENSATING THE LIST OF SAILING-BOATS OF ALL CLASSES

Filed July 12, 1965 2 Sheets-Sheet 2

Fig.3.

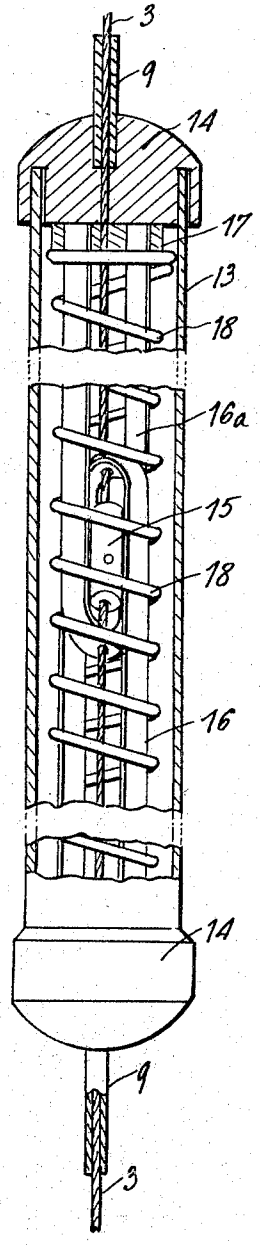


Fig.4

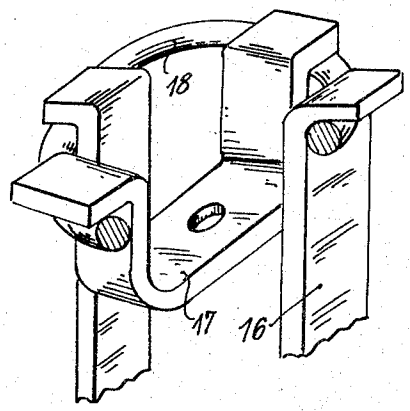


Fig.5.

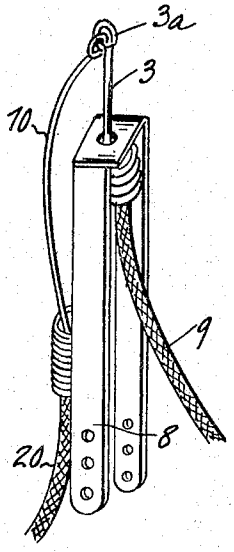
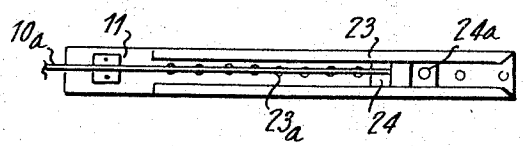


Fig.6.



Inventor
Yves Henri Marie Criou
By Alvin Browdy
Attorney

United States Patent Office 3,323,480
Patented June 6, 1967

3,323,480

MAST COMPENSATING THE LIST OF SAILING-BOATS OF ALL CLASSES

Yves Henri Marie Criou, 122 Blvd. Jean-Moulin, Valras-Plage, Herault, France

Filed July 12, 1965, Ser. No. 471,288
Claims priority, application France, July 21, 1964, 983,218; June 18, 1965, 2,100
3 Claims. (Cl. 114—91)

The present invention relates to a mast for compensating the list of sailing boats, in order to improve navigating possibilities of the latter by affording them a maximum stability and great safety, even during the worst weather.

It enables the boat to have a better floating-line and to increase navigation speed by preserving the boat from listing, while keeping it on the course chosen.

Up till now, the masts of sailing boats were fixed, either in an erecting pit, or simply set on a fixed base. They were rigidly held in a vertical position by stays definitely fixed to fixed or movable channel-plates and guyed by various known devices.

It is known that an arrangement of this kind involves considerable drawbacks. Actually, the entire assembly formed by the hull, the mast and sails is subjected to a very strong force by the thrust of winds, which causes a more or less heavy list of the boat, sometimes causing it to capsize. This has a great effect on centre-board boats and sometimes this type of vessel is found upside down in the water with the mast in a vertical position, thus making it extremely difficult the righting of the boat.

It also occurs that when the hull of sailing boats resists listing, and thus does not turn over, the mast snaps off short and falls into the water with all sails set. This latter case is particularly dangerous for it puts the boat in a perilous position.

A considerable list of a boat causes it to lose speed, so much so that the navigator must continually luff and even sometimes shorten sail by rolling or reefing.

The present invention obviates these disadvantages by providing a mast with its stays and sails, articulated at its base and able to slope transversally. On this account, the ship can slope at about 30° instead of the boat's hull, the latter thus retains its normal floating-line at a maximum.

The boat being on the weather-roll, beyond a certain wind force, the thrust exerted on the sails which is fixed at a 30° list, can then make the boat's hull list as far as 60°. The vessel cannot thus capsize because the sails are then in a completely out of the wind horizontal position, being at 30°+60°=90°.

According to the invention, the mast compensating for list is characterized in that its foot is mounted on an articulation integral with the hull of the boat, this mast being held at its top part by stays connected to a compensating device fixed inside the hull, this compensating device being controlled by a regulating device.

Various other characteristics of the invention will moreover be revealed by the detailed description which follows.

One form of embodiment of the purpose of the invention is shown, by way of example, in the accompanying drawings.

FIGURE 1 is an elevational sectional view of a sailing boat with canting mast.

FIGURE 2 is a plan view corresponding to FIG. 1.

FIGURE 3 is an enlarged elevational sectional view of the compensating device with portions broken away to show details.

FIGURE 4 is a perspective view, at an enlarged scale, of one part of the members of the compensating device.

FIGURE 5 is a perspective view of one of the devices for tensioning the shrouds.

FIGURE 6 is a plan view of a regulating device.

FIG. 1 shows, fragmentary sectional, the hull of a boat **1** where it can be seen, on the one hand, the mast **2** and its stays **3**, and, on the other hand, the compensating device **4**. Dotted lines show the listing position of the mast **2** sloped at 30°, the hull having remained horizontal in its normal water lines.

FIG. 1 shows that a mast step **6**, secured on the bottom of the hull, comprises a spindle **5** around which the mast **2** can swivel. At the top of the mast, there is also a top mast bar **7** whose ends each terminate by a sleeve **7***a* securing the stays **3** and thus keeping them apart in a regular manner whatever the slope of the mast **2**, in order to take up the slack that may occur on the stay, on the list side. This topmast bar, which is incurved, is not fixed on the mast **2**. On both sides of the hull, there are two devices for tensioning the shrouds **8** articulated on spindles integral with channel-plates fixed on the upper edge of the boat's hull. The stays **3** and their sheath **9** pass through a hole bored in the top part of each device for tensioning the shrouds **8**, the stays **3** comprising, at a certain distance from said devices **8**, connecting members **3***a* enabling the two cables **10** to be fixed that are lodged in the sheaths **20**.

The cables **10** are attached at their other end to a connecting bar **10***a* ending at a slide or anchor block **24**, placed in a slide-bar or track member **23** forming with the slide **24** of the regulating device.

It will be noticed that the bottom of the slide-bar **23**, which is firmly fixed on the lower central part of the hull **1**, is drilled with holes **23***a* cooperating with a hole **24***a* drilled in the slide-bar **24** so that the crew can correctly set the regulating device acting through the cables **10** on the stays **3**.

In FIG. 2, the hull of the boat is shown without the mast in order to display the location of the regulating device **11** and the compensating device **4** on a centre-board boat. The centre-board well **12** is in the centre of the hull **1**. The compensating device **4** can be located at any point on the boat but it is necessary that the latter's hull must be strengthened, for example, by two uprights extending from the fixed channel-plate, at a particularly strong point of the centre of the bottom of the hull **1**.

FIG. 3 shows the compensating device fragmentary sectional. This device is formed by a tube **13** closed at each end by a perforated cap **14** to allow the cables (under sheath) to pass, which form the stays **3**. These cables are joined or held in the centre, in a casing **15**, known in itself, but after passing into the two parts **16** and **16***a* which are movable, inversed U-shaped, and have opposed bight portions placed perpendicularly to each other and each connected at their open end to a tension brace **17**. A spiral spring **18** is placed between the braces **17**, this spring surrounding the parts **16** and **16***a*.

The tension of one of the cables, proportional to the wind force exerted on the sails, brings the casing **15** (without any real back-lash between the parts **16** and **16***a* and the casing) into contact with one of the parts **16**, attracts the brace **17**, compresses the spring **18**, whose calculated strength leaves a certain length of cable imparting a sufficient list to all the sails.

FIG. 4 shows in a partial perspective view, the tension member by the brace **17**, of the compensator **4**, placed between the U-shaped parts **16** and **16***a*. The brace, as well as the parts **16** and **16***a* terminate by an angle plate forming a hook which holds the spring **18**. The brace is kept in position by studs or screws, extending from the arms of the parts **16**.

FIG. 5 shows in a perspective view, a shroud tensioning device **8** shaped like a cap, fixing on the usual channel-plate **19** of the boat. It is from inside this device **8** that the protecting casing **9** of the cable **3** extends inside, the casing attachment **20** is fixed going to the regulator, this casing protecting the cable **10**.

In FIG. 6, the regulator **11** can be seen which consists of a slide-bar **23** fixed on the hull of the boat and drilled with a certain number of holes **23***a* fairly close together, as stated above.

To set the slope of the mast, it suffices to introduce into the hole **24***a* and one of the holes **23***a* of the corresponding slide-bar, a suitable peg for setting the tension of the cable **10** which thus enables the tension of the stays **3** to be set, so that the mast **2** can slope progressively in the opposite direction to the wind to an extent comprised between 0 and 30° list.

The regulator **11** is fixed behind the centre-board well **12** within reach of the steersman who can thus easily operate it, this regulator enabling, with a steady wind, the stabilization in a suitable position of the exit of one of the strands of the compensator stays, according to the degree of list required.

In certain cases, the regulating device can be formed by a rack and a toothed member enabling the stabilizing of various operatory positions corresponding to a given slope of the mast.

I claim:

1. In a sail boat having a hull, a mast articulately mounted at its base in said hull, stays extending from opposite sides of an upper portion of said mast to opposite sides of said hull, and means connected between said stays and said hull for automatically compensating for list of said mast in relation to said hull, said means

comprising a compensating device and a regulating device, said compensating device comprising a casing having ends of the respective stays threaded therein, a pair of overlapped U-shaped members having relative movement in said casing and having bight portions disposed in opposed relation, means secured to said stays and disposed between said bight portions, a spring circumposed about said U-shaped members and terminally engaged with said members for normally urging said members apart, and stirrups secured to each of said stays and respectively engaged with opposite ends of said spring.

2. The structure as claimed in claim **1** in which said regulator device comprises cables connected to intermediate portions of said stays, an anchor block connected to said cables, a track member reciprocally receiving said anchor block, and means for adjustably positioning said anchor block in said track member.

3. The structure as claimed in claim **1** including residual tensioning devices connected to said respective stays at opposite sides of said hull.

References Cited

UNITED STATES PATENTS

236,237	1/1881	McLeod	114—91
2,353,007	7/1944	Blackman	114—91
2,646,763	7/1953	Sveinsson	114—39
3,099,976	8/1963	Schwaneke et al.	114—91

FOREIGN PATENTS

30,537	3/1920	Norway.

MILTON BUCHLER, *Primary Examiner.*

T. M. BLIX, *Assistant Examiner.*