April 15, 1969 L. L. CURTIS ET AL 3,438,349

BALANCED BEARING SAILBOAT TRAVELER

Filed Sept. 11, 1967 Sheet 1 of 3

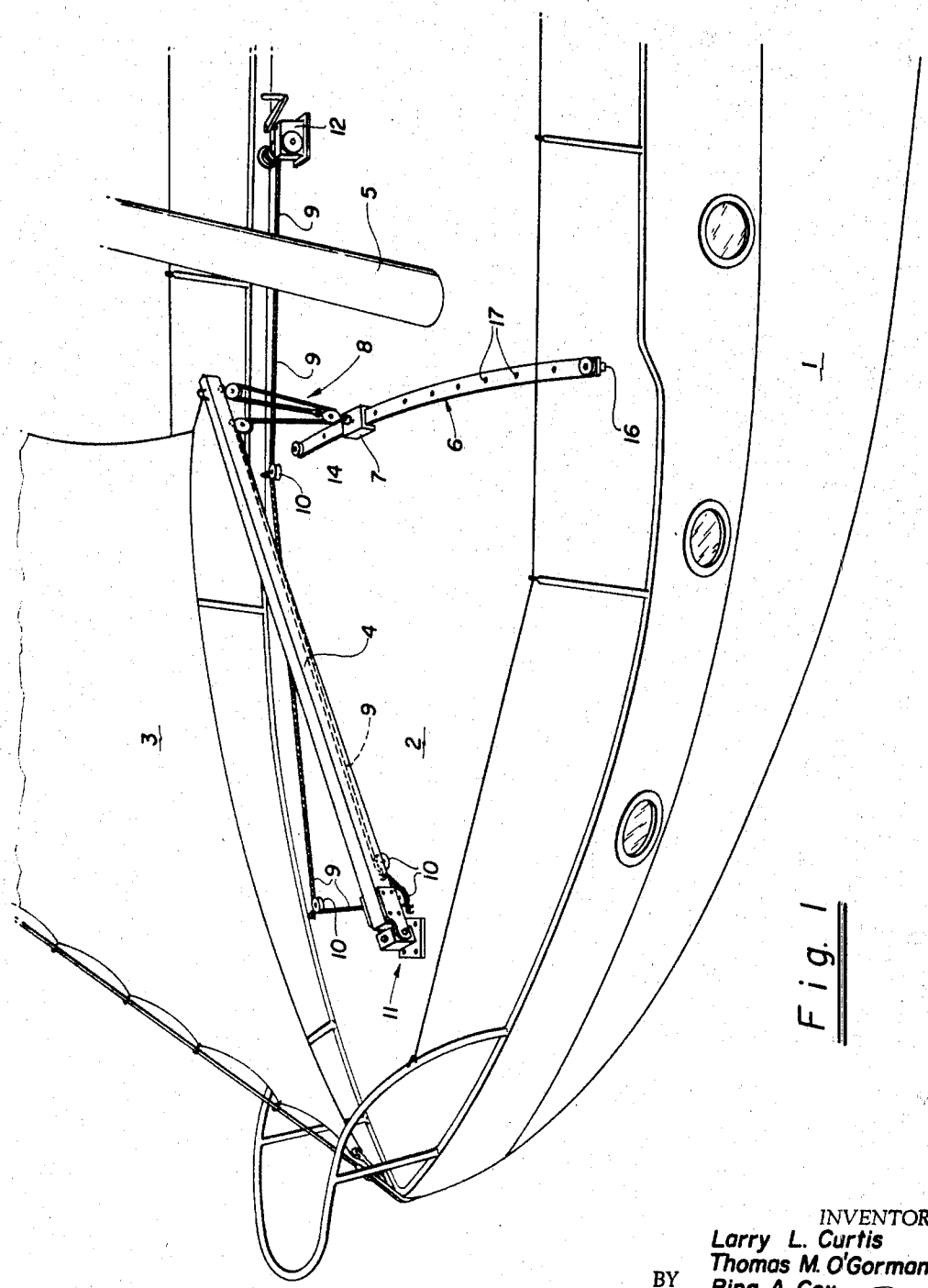


Fig. 1

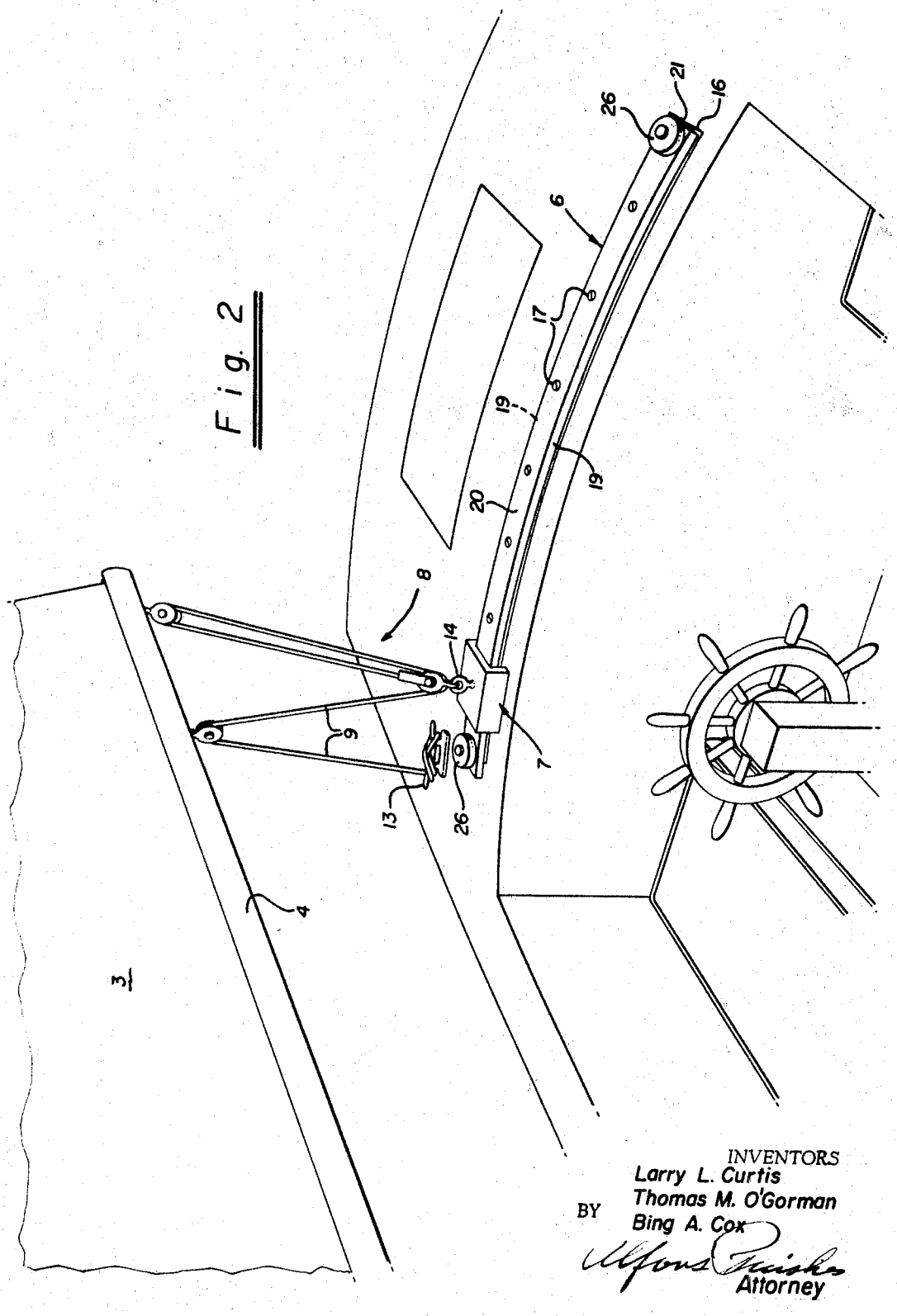
INVENTORS
Larry L. Curtis
Thomas M. O'Gorman
Bing A. Cox
BY
Attorney

April 15, 1969 L. L. CURTIS ET AL 3,438,349

BALANCED BEARING SAILBOAT TRAVELER

Filed Sept. 11, 1967 Sheet 2 of 3

Fig. 2



INVENTORS
Larry L. Curtis
Thomas M. O'Gorman
Bing A. Cox

BY Alfons Puiska
Attorney

April 15, 1969 L. L. CURTIS ET AL 3,438,349

BALANCED BEARING SAILBOAT TRAVELER

Filed Sept. 11, 1967 Sheet 3 of 3

Fig. 4

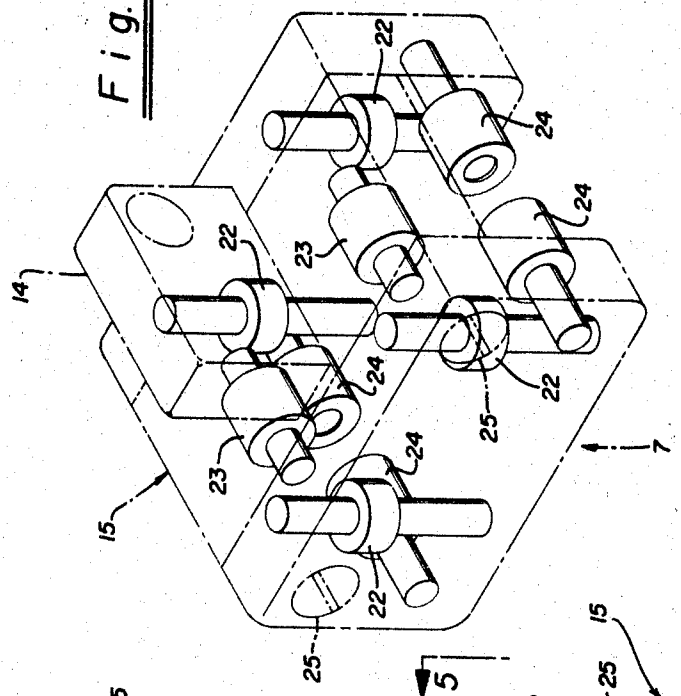


Fig. 3

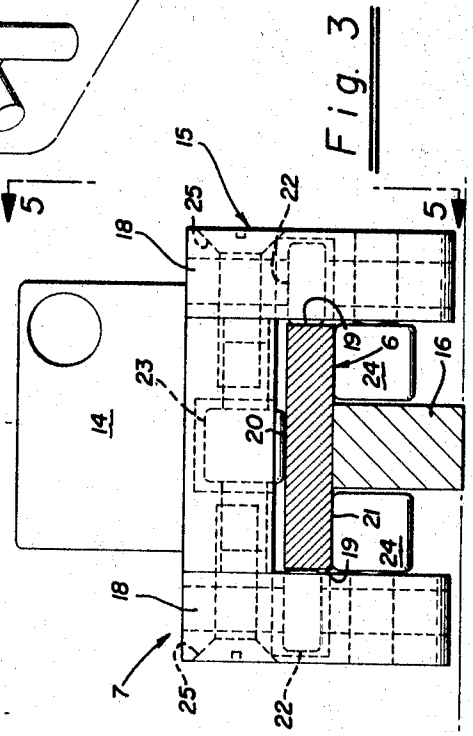
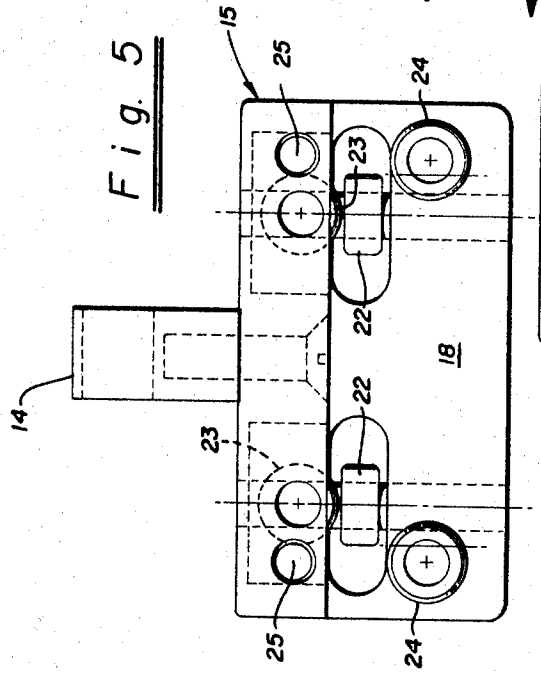


Fig. 5



INVENTORS
Larry L. Curtis
Thomas M. O'Gorman
Bing A. Cox

BY Alfons Puzinas
Attorney

United States Patent Office 3,438,349
Patented Apr. 15, 1969

3,438,349

BALANCED BEARING SAILBOAT TRAVELER

Larry L. Curtis, 303 Olive Ave., Larkspur, Calif. 94939; Thomas M. O'Gorman, 21 Echo Ave., Corte Madera, Calif. 94925; and Bing A. Cox, 7700 Palma Parkway, Sacramento, Calif. 95823

Filed Sept. 11, 1967, Ser. No. 666,741
Int. Cl. B63h 9/10
U.S. Cl. 114—102 4 Claims

ABSTRACT OF THE DISCLOSURE

An improved sailboat fitting or traveler for use in guiding and controlling the motion of the boom of a sailboat. A runner or carriage is connected to the boom through conventional ropes and blocks to the boom or spar and arranged to travel on a T-shaped rail. The runner is equipped with anti-friction bearings to bear upon the surfaces of the T, in a novel arrangement so as to provide ease of travel of the runner on the rail and hence operation of the sail regardless of the magnitude or direction of the wind pressure, position of the sail or relative directions of movement of the boat.

Background of the invention

In the operation of a sailboat the angular position of the sail with respect to the keel is of utmost importance from the standpoint of efficiency and safety. This is true of the mainsail as well as the jib. To facilitate this angular positioning, an item of sailboat hardware known as a traveler is utilized. This consists essentially of a horizontal rail which may be straight or curved upon which a runner or carriage is arranged to ride. The outer end of the boom or spar may be secured on one end to the runner through various arrangements of block and tackle known to those skilled in the art as "boom vang," and at the other end to a cleat, belaying pin or a winch. Two sets of fastening means located on opposite sides of the boat may be used. The boom may also be merely secured to the runner through suitable blocks and tackle and left to swing back and forth through a predetermined arc established by stops positioned on the rail and set according to the direction of the wind.

As is well known to those skilled in the art, tremendous stresses are induced in the traveler due to the wind pressure from the sails. The latter may go as high as 1200 pounds or more and vary from zero to this figure in a matter of seconds. It is known also that while these stresses are greatest and most frequent in the upward direction due to the action of the boom, they are by no means uniform in direction and, of course, have components in several planes. This has the effect of causing excessive friction between the runner and rail of conventional travelers and in some instances causing binding between the two. Adjusting the angular position of the boom by means of the sheet lines thus becomes a major problem and despite the use of multiple blocks, sometimes requires the exertion of an effort of 600 pounds and more even in the case of a relatively small boat. It is evident that under these conditions a crew of at least four men would be required to man the boat.

Attempts have been made to overcome this problem by incorporating ball bearings in the runner but these have not been successful.

Summary of the invention

It is therefore a principal object of our invention to provide a traveler for a sailboat which would operate freely and easily under all conditions of load from the sail.

It is another object of our invention to provide a traveler for a sailboat which would operate with freedom from jamming or binding.

It is yet another object of our invention to provide a traveler for a sailboat which would permit adjusting of the position of the sail boom while under way with a very minimum of effort.

It is a more specific object of our invention to provide a traveler for a sailboat in which the runner is equipped with anti-friction bearings arranged to bear upon a specially shaped rail and positioned so as to handle the load from the runner to the rail with minimum friction regardless of its direction, magnitude or suddenness of application.

It is finally an object of our invention to provide a traveler for a sailboat which would be superior from the standpoint of maintenance as well as operation to those now in use.

We have discovered that by providing anti-friction bearings and locating them as disclosed herein we obtain not only an improvement but an unusual and unexpected reduction in the friction between runner and rail and a complete elimination of sticking or binding between runner and rail.

Description of the invention

FIG. 1 is an isometric view of the bow or forward end of a sailboat showing an application of a traveler to a jib.

FIG. 2 is an isometric view of the stern or after end of a sailboat showing an application of a traveler to a mainsail.

FIG. 3 is a cross-section through the rail of our invention showing also the bearings in the runner.

FIG. 4 is a phantom isometric view of the runner of our invention showing a general bearing arrangement.

FIG. 5 is a longitudinal elevation showing the location of the center lines of the bearings with respect to each other.

Description of the preferred embodiments

Referring first to FIGS. 1 and 2 there is shown the installation of a typical traveler which might also be the traveler of our invention. In FIG. 1 the traveler is shown applied to a jib, while in FIG. 2 it is shown applied to a mainsail. The principle of operation and problems encountered are generally the same in either case.

The bow portion of a sailboat hull **1** carries the forward deck of the boat **2**. A sail **3**, which may be either a jib or mainsail, is carried by boom **4**. A conventional mast is shown at **5**. The traveler rail **6** may have either a straight or curved configuration and in the case of our invention has a T-shaped cross-section. The traveler runner or carriage **7**, the block and tackle **8** comprising the boom vang connects to sheet line **9** over suitable pulleys or sheaves **10**. The sheet line **9** may be secured to a winch **12** as shown in FIG. 1 or to a cleat **13** as shown in FIG. 2. In the case of a jib, FIG. 1, the boom **4** is supported by a pedestal and pivot **11**. The eye **14** serves to connect the rigging described above to the runner which will now be described in detail and for which reference should be had to FIG. 3, FIG. 4 and FIG. 5.

The runner of our invention comprises a housing **15** which is mounted upon the T-shaped rail **16**. The top horizontal portion of the rail may be fastened to the vertical or stem portion by means of counter sunk head screws **17**.

The runner housing **15** is equipped with removable sides **18** for convenience in assembly and disassembly. The rail **6** is characterized by three important surfaces, namely, the edge surface **19**, the top surface of the horizontal section **20** and the bottom surface of the horizontal section **21**. These surfaces have riding upon them respec-

tively, edge surface bearings **22**, top surface bearings **23**, and bottom surface bearings **24** which are mounted in housing **15** as shown. The housing parts are held together with screws **25** and the stops which may be of rubber or similar material, serve to limit the travel of the runner on the rail.

We may use various types of anti-friction bearings, but have discovered that needle bearings seem to work most satisfactorily. These may be of the conventional hardened steel type which is commercially available, or may be made of stainless steel. The importance lies in the arrangement and relative position of the bearings rather than in their construction.

We have discovered that the greatest stresses and hence bearing pressures which are produced are usually in an upward direction and hence have provided two pairs of bearings **24** to bear against bottom surface **21**. When there is no load in an upward direction, the runner travels easily on top bearings **23**. Very often there is a torsional or twisting action upon the runner due to rapid wind variations and these we take care of by edge bearings **22**. These are in two pairs located as shown. It is thus clear that with the arrangement we have disclosed we are able to take care of any single or combination of forces exerted by the sail regardless of direction or magnitude.

We have discovered further that by locating bearings **23** so that vertical center lines lie inside the vertical center lines of bearings **24**, a further advantage is realized. We have not been able to explain the reason for this fully, since the stresses which a runner must absorb are so complicated in directions and magnitudes that it is difficult to resolve them into components to permit accurate machine design. We have verified experimentally, however, that tremendous improvement is realized in using the arrangement shown which we have chosen to call our "balanced" construction. Further improvement also seems to result by keeping the distance between the respective center lines of these pairs of bearings the same on opposite ends of the runner.

We claim:

1. An improved runner for a sailboat traveler having an inverted U-shaped cross-section disposed to ride upon a rail having a vertical and a horizontal member forming a T-shaped cross-section characterized by:

a first pair of anti-friction bearings mounted centrally on opposite ends of the upper portion of said runner and disposed to bear upon the center of the upper surface of said horizontal member of said rail;

a second pair of anti-friction bearings mounted at one end of the lower portion of said runner in axial alignment with each other end disposed to bear upon the lower surface of said horizontal member and respectively on opposite sides of said vertical member of said rail;

a third pair of anti-friction bearings mounted at the other end of the lower portion of said runner in axial alignment with each other and disposed to bear upon the lower surface of said horizontal member and respectively on opposite sides of said vertical member of said rail;

a fourth pair of anti-friction bearings mounted at one end of the upper portion of said runner having their axes of rotation in a vertical plane and disposed to bear upon opposite ends of said horizontal member of said rail;

a fifth pair of anti-friction bearings mounted at the other end of the upper portion of said runner having their axes of rotation in a vertical plane and disposed to bear upon opposite ends of said horizontal member of said rail.

2. The device of claim **1** in which said anti-friction bearings are of the needle type.

3. The device of claim **1** in which said fourth and fifth pairs of bearings are so positioned that the vertical center line of each pair of bearings lies between the vertical center lines of the second and third pairs of bearings.

4. The device of claim **3** in which the vertical center lines of said fourth and said fifth pairs of bearings are the same distance from the nearest vertical center line of said second and said third pairs of bearings respectively.

References Cited

UNITED STATES PATENTS

1,695,674	12/1928	Wilson	114—112
1,722,618	7/1929	Wilson	114—112
2,103,630	12/1937	Morin	114—101
2,976,091	3/1961	Miller	308—212

TRYGVE M. BLIX, *Primary Examiner.*