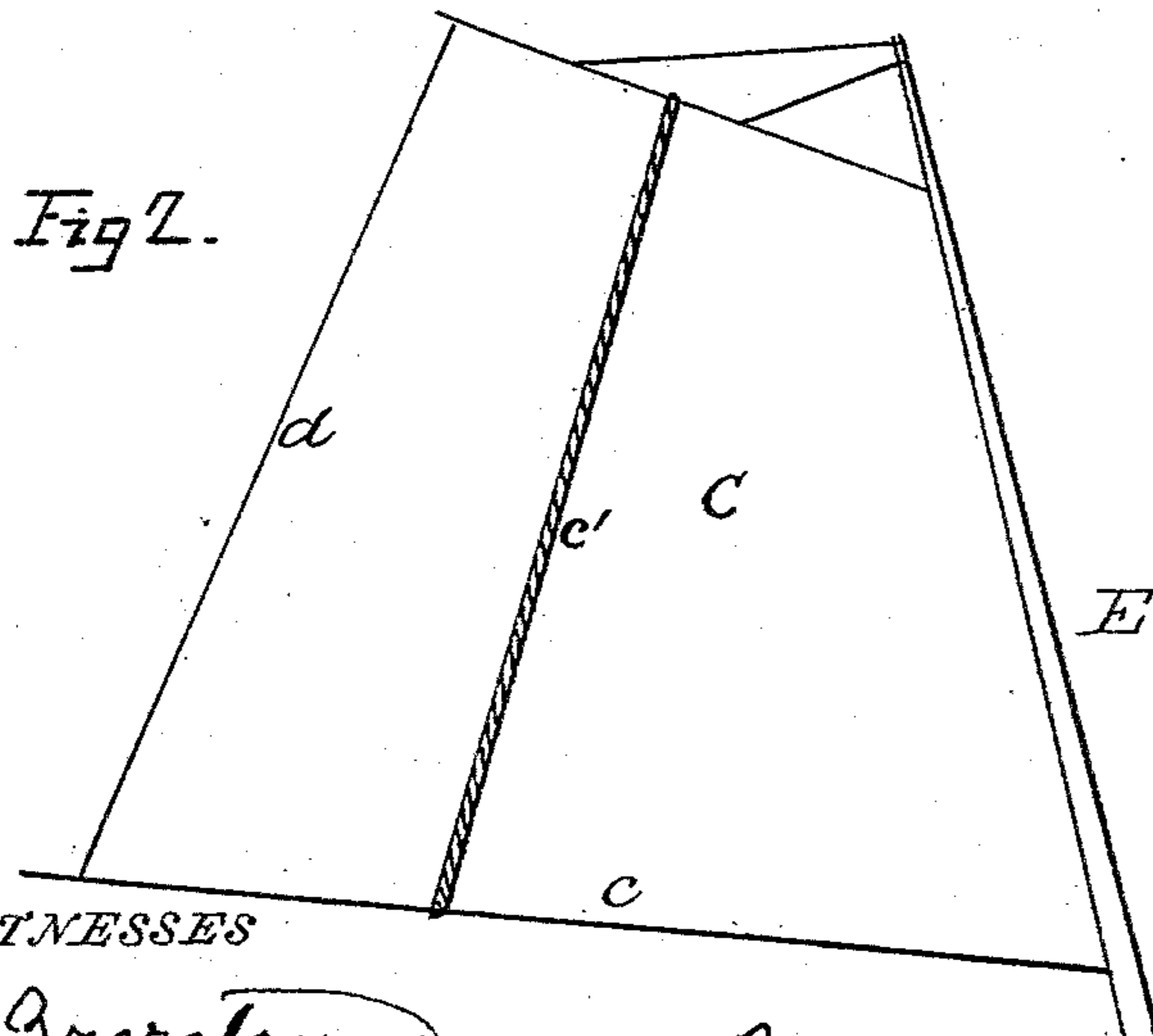
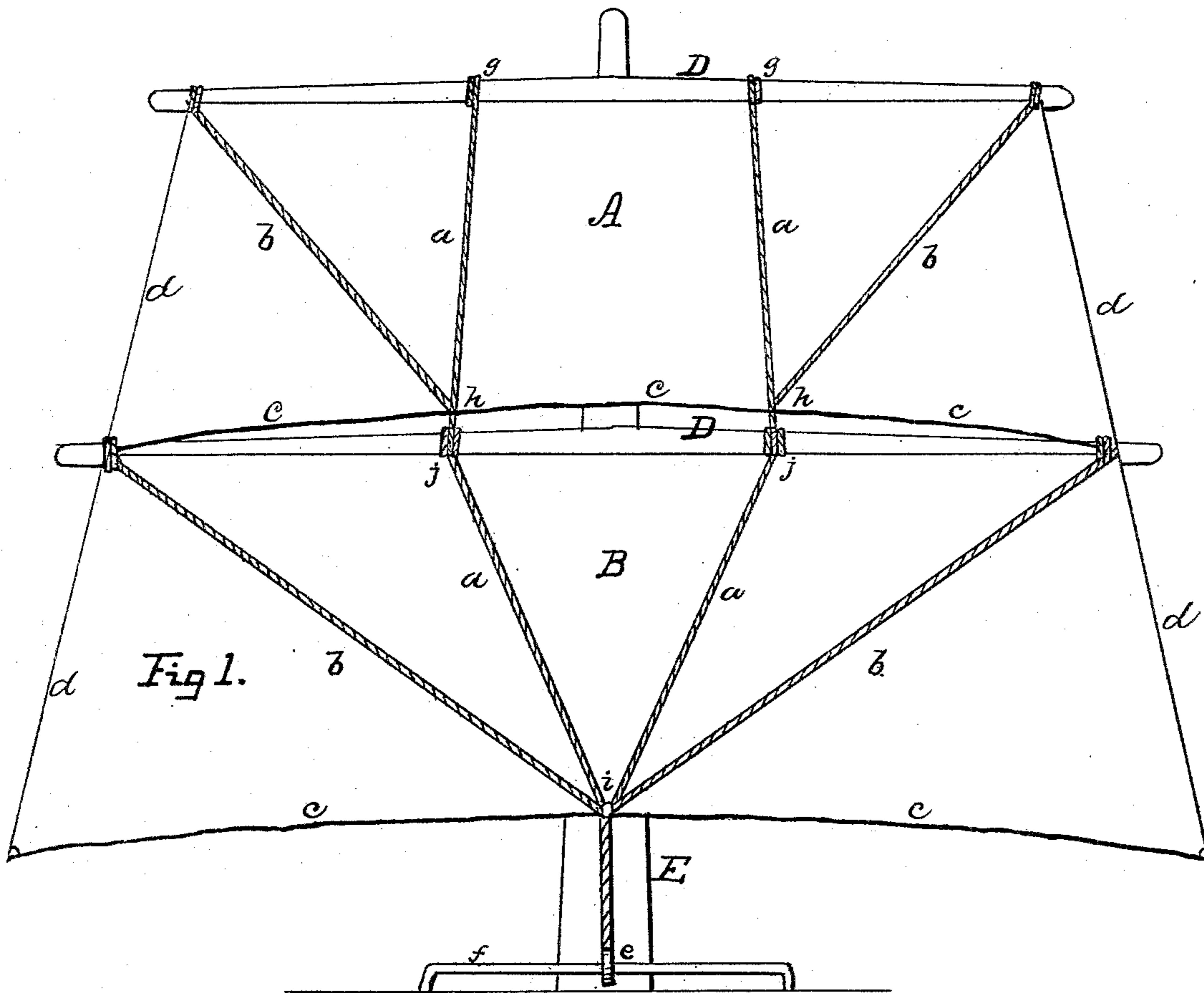


(No Model.)

J. ROBERTS.  
SHIP'S SAIL.

No. 401,373.

Patented Apr. 16, 1889.



WITNESSES

Wm. S. Brereton  
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# UNITED STATES PATENT OFFICE.

JOHN ROBERTS, OF BOSTON, MASSACHUSETTS.

## SHIP'S SAIL.

SPECIFICATION forming part of Letters Patent No. 401,373, dated April 16, 1889.

Application filed January 12, 1889. Serial No. 296,209. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN ROBERTS, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Ships' Sails, of which the following is a specification.

This invention relates to ships' sails, particularly top-sails, top-gallant sails, courses, and main and fore sails; and the said invention consists in providing the sail midway between the extremities thereof with two or more ropes, which extend across the sail and are secured thereto from the head to the foot thereof, and are fastened to the yards or gaff and boom, as the case may be, for the purposes as will presently appear.

The object of this invention is to equalize the strain upon ships' yards in such a manner as to make them bear nearly three times as much as they do with the present rig by removing the strain from the yard-arms to the quarter; consequently the yards need not be more than half as heavy to bear the required strain.

Another object of this invention is to strengthen the gaff and booms of yachts and fore-and-aft sails and prevent the bagging out of such sails in the center.

Referring to the accompanying drawings for a better understanding of the details of construction of my invention, Figure 1 represents a top-sail and course, and Fig. 2 a yacht-sail constructed according to my invention.

A designates the top-sail, B the course, and C the main or fore sail of a yacht. D D are the yards; *a a*, the quarter-ropings; *b b*, diagonal ropings; *d*, the leech; *e*, the foot-ropes, and E the mast.

*Directions for making the sails.*—Take and rope, as at *a*, the top-sails A on the fore part from one-third the head, as at *g*, both sides, measuring from the center, to one-third the foot, as at *h*, to which an additional sheet, B, is to be hooked, coming through an iron sheave secured with two iron bands at one-third the lower yard, as at *i*, in line and leading to the deck. Rope the courses B, also, from one-third the head both sides, as at *j*, to the center of the foot.

To the center of the foot a midship-tackle is to be hooked, as at *e*, that works on a traveler, *f*, upon the deck, and situated so far forward on the deck as to be in line with that part of the shifter that the foot of the sail touches, and the chesstree or place of the tack when the yard is braced up and so far across the deck that the extremities of it will be in line with the center of the yard and foot when the yard is braced up. The heads of the quarter-ropings *a* of the top-sails and courses are to be lashed to the quarters of the yards in the same manner as the outer ear-rings, and the diagonal ropings *b b*, which extend from the outer ear-rings to the foot of the quarter-ropings *a*, must be roped on the after part of the sail, so as to show a selvage or leech on the after part when the outer clews are hauled up on the fore part in squally weather.

The top-sail is set the same as any other. When set, haul the quarter-sheets taut. As the breeze increases and the yard-arms begin to buckle to the yard-arm sheets so much more in proportion than the quarters do to the quarter-sheets as their distances are greater from the center or slings, it is evident that the whole strain of the sail is thrown into the quarters or place of the innersheets, except that of that part of the sail which is spread by the outer sheets, and that is only one-third of their respective yard-arms. The courses also in the same manner equalize the strain on the lower yards when set without a top-sail above them, as the top-sails do to the top-sail yards, for when the yard-arms bend to the tacks and sheets more in proportion than the quarters do to the quarter-ropings and midship-tackle from the deck as their distances are greater from the center the yard-arm must be relieved of all the strain except the strain of that part of the sail which is spread by the tacks and sheets, and that is one-half of the whole. The midship-tackle is not started in tacking or performing any other evolution, but allowed to travel across the deck.

In yachts and fore-and-aft rigged vessels the sail, as shown in Fig. 2, is to be roped from about one-half the head to about one foot inside of one-third the foot, measuring from the clew. The middle roping, *c'*, is to

bear about one-half the strain of the whole sail, or to be the size of the after leech-rope of a sail of the present rig, and the leech to bear about one-half of the middle roping. When  
5 the sail is set, the middle rope is lashed to the boom in line. Then when the boom begins to buckle to the strain on the after leech, as the breeze increases that strain will be transferred to the inside roping, similar to the  
10 case of the outer and inner sheets of the top-sails. It is thus seen that the sail will not only set better, but that the boom need not be more than half as heavy.

In reefing you have only to put another  
15 lashing for each reef through the cringles in the roping through the sail and around the boom.

Having thus described my invention, what I

claim as new therein, and desire to secure by Letters Patent of the United States, is as follows, viz: 20

1. A ship's sail having one or more ropes extending vertically midway across the same, secured to the sail and to the yards or gaff and boom, substantially as described. 25

2. A ship's sail having one or more ropes extending vertically midway across the same, secured to said sail and to the yards or gaff and boom, and a rope also secured to the sail extending from the top outer corner of the  
30 sail to the foot of the vertical rope, substantially as described.

JOHN ROBERTS.

Witnesses:

CHANDLER EASTMAN,  
JAMES D. HARRINGTON.