

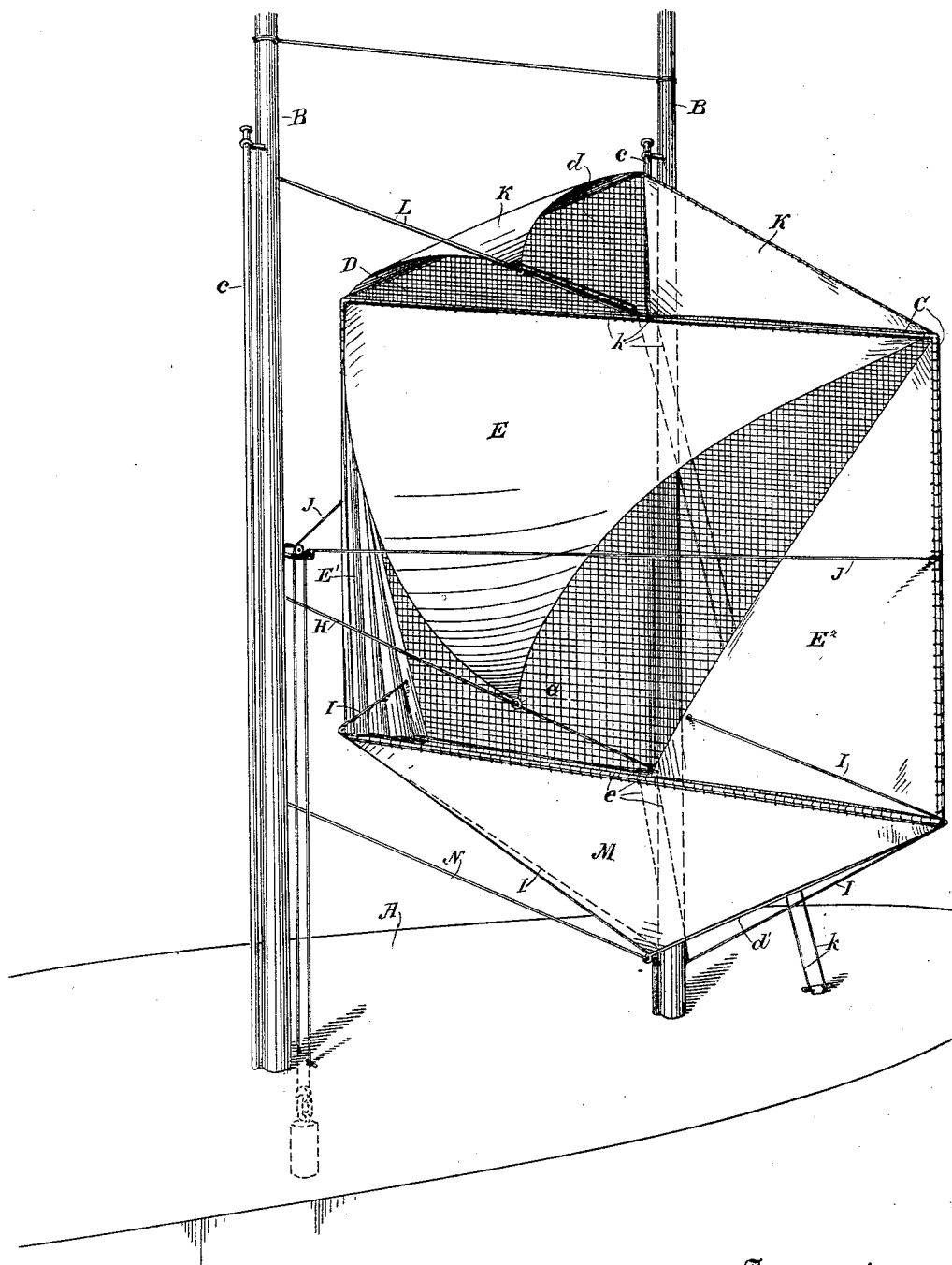
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A. V. SMITH.
SAIL RIG FOR SHIPS.

(Application filed Aug. 9, 1899.)

(No Model.)



Witnesses,
J. H. House
J. F. Aschbeck

Inventor,
Andrew V. Smith
By *Dwight Strong* Esq.

UNITED STATES PATENT OFFICE.

ANDREW V. SMITH, OF SAN FRANCISCO, CALIFORNIA.

SAIL-RIG FOR SHIPS.

SPECIFICATION forming part of Letters Patent No. 633,705, dated September 26, 1899.

Application filed August 9, 1899. Serial No. 726,681. (No model.)

To all whom it may concern:

Be it known that I, ANDREW V. SMITH, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Sail-Rigs for Ships; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a novel rigging for sailing vessels.

It consists, essentially, in an arrangement of the sails whereby the pressure of the wind upon them is better applied to the propulsion of the vessel and in a means for relieving the pressure on certain portions of the sails when tacking ship or going about in sailing on the wind.

It also comprises details of construction, which will be more fully explained by reference to the accompanying drawing, in which the figure shows a rig with its sails attached to it.

It is well known by those familiar with the art that the speed of a ship when "close-hauled," as it is termed, is retarded by the great pressure of wind against the masts, rigging, and other top hamper. This is well illustrated by the position of the sails of a ship while "lying to," as it is technically called. The sails of one mast act to hold the ship back, while all those of the other two masts in a three-masted vessel, as well as the jibs, act to push her forward, the result of the opposing actions being that the vessel lies still without headway in either direction, although the pressure in different directions is as one to two.

It is the object of my invention to relieve the ship of much of this pressure which is lost in direct propulsion and to so arrange the sails that they can be handled with a much less force of men than in the ordinary arrangement.

A is the hull of a vessel.

B B are the masts, and C are frames set twelve inches or more abaft of the masts and covered by steel-wire netting, as at D. The sails E E' E² are made triangular in shape and are carried upon these frames C, which are abaft of the masts. These frames may be made of metal, wood, or partly of both, and they take the place of three or four of the

yards ordinarily used upon ships. This framework is here shown as supported upon a central vertical spar c, which is pivoted and turn-able at the rear of the mast, one end being pivotally supported at the top and the other extending down through the upper deck, where it is properly fulcrumed to allow it to swing sufficiently to secure the necessary travel of the yards in bracing them up when the ship is sailing close to the wind on either tack.

The steel-wire netting D is for the purpose of keeping the sails in proper position, and it also serves as a foot and hand hold for sailors to climb upon and pass through, the meshes being practically about sixteen inches in size.

The framework may be made of steel tubing or any other suitable or desired material.

The space between the upper yard and the one next below carries three triangular sails, and the one below this carries three more arranged in a similar manner. These sails are arranged as follows: The sail E is made triangular in shape, and its upper edge is seized or secured to the length of the yard in the usual manner. The lower edges of this sail are convergent, terminating at a point adjacent to the next yard below. From this angle a controlling-rope may lead to the deck of the vessel. These triangular sails have fixed at this angle a loop or ring G, which serves as a traveler, and this loop or ring is adapted to travel upon a rod or stay H, which extends from this point backward and upward to the mast next behind, so that when the rope or sheet holding this point of the sail is cast off the sail may in certain conditions swing backwardly from the network in which it normally rests under the pressure of the wind, and when it thus swings backwardly and upwardly it is relieved from any pressure from the opposite side. To the outer vertical sides of the frames which carry the screen are seized or fixed the sails E' and E². The lower edges of these sails extend horizontally and have ropes or sheets e attached to them and leading to the deck of the vessel, by which ropes they may be hauled inwardly and made to set properly. The hypotenuse or longer edge of each of these sails coincides approximately with the con-

vergent edges of the sail E, so that when all these sails are sheeted home they form practically a single rectangular sail which rests against the netting before described and at the rear of the mast which carries them. This construction as described for one yard is practically the same for the next adjacent set of sails.

To the center of the hypotenuse of each of the sails E' E² is connected a rope I, which leads through a pulley-block near the outer angle of the sail, so that by hauling upon this rope when the main sheet of the sail E is slackened the sail will be drawn down and practically furled at this outer angle. The operation with these sails will then be as follows: When the ship is making a tack, the lower points of the larger sail E will blow back and upward, the rings or travelers moving upon the diagonal stays previously described, so that the sail will be kept in place; but there will be no pressure on these particular sails. There will be a pressure of the wind upon the royals and upon the wings E' or E² on the windward side, while the corresponding wing upon the leeward side is drawn down or furled by its furling-rope I, as above described. The pressure thus remaining upon the windward sail will easily carry the ship about on the other tack and course and will insure this movement without any danger of missing stays. In order to swing the frames carrying these sails, ropes or chains J are fixed to the side frames, and these extend rearwardly and inwardly to the next mast abaft and there, passing through suitable pulleys, they pass down through a hawse-pipe fixed in the deck near the mast and around a pulley, with a weight attached, thence up through a like pulley at the mast and to the other side of the frame, so that one portion of the rope is drawn in while the other is equally extended as the sail-carrying frames swing to bring the sails properly into the wind. These ropes or sheets can be belayed or secured when the sail is in the proper position in any suitable or desired manner. A locking block or plug may be inserted in the hawse-pipe to bind the rope at this point or they may be secured in other suitable ways.

The royals K are triangular sails, the bases of which are secured to the upper yard or frame, and their inner lower angles are fitted to travel on stays I, as described for the sail E, when the ship goes about.

k k are the controlling-sheets.

M is a triangular sail secured to and extending below the lower yard, and its lower apex is movable upon a stay N.

To tack the ship will require then, first, that the sheets of all the central triangular sails be cast loose to allow the lower points to move backwardly, their travelers moving up the supporting-stays, and the yard-braces

are paid out enough to allow the yards to swing. Then the sheets for the lee wings or sails E' E² are cast off, and these sails move out to the end of their yards and the ship is immediately advanced. The central sails flowing out to the angle of about forty-five degrees will not retard the steerage-way. Then when the vessel has swung past the winds-eye the fore and main frames are swung to their proper position for the other tack. The mizzen-frame being already nearly in place, the strain on the braces and sheets will practically do all this work automatically.

If desired, a capstan may be used to pay out the wing-sail sheet in tacking. This power will also pull in the slack of the brail-rope, thus holding the sail steady until the vessel has come around.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a rigging for ships, a rectangular frame supported and turnable upon a vertical axis at the rear of the mast, a netting stretched upon said frame and adapted to carry the sails of the vessel.

2. In a rigging for vessels, one or more rectangular frames having a netting fixed thereto, and sails extended thereon, a vertical central spar supported and turnable at the rear of the mast, and means for swinging the frame about said support.

3. In a rigging for vessels, one or more rectangular frames with netting stretched thereon, a vertical centrally-journaled spar in line at the rear of the mast, sails supported upon said framework, consisting of an upper triangular sail having its upper horizontal edge seized or secured to the framework, the other edges convergent to a point below, other triangular sails having their outer edges seized to the vertical outer portions of the framework, their lower edges extending horizontally and the hypotenuse coinciding with the lower converging edges of the first-named sail when all are sheeted home.

4. In a rig for ships, one or more rectangular frames turnable about central vertical supporting-spars at the rear of the respective masts, and having a supporting-network fixed thereto, triangular sails seized respectively to the horizontal upper and vertical outer sides of the framework, connections with the points of said sails and ropes leading therefrom to the deck of the vessel whereby the sails may be sheeted home and form a rectangular sail-surface approximately coincident with the outline of the supporting-frame.

In witness whereof I have hereunto set my hand.

ANDREW V. SMITH.

Witnesses:

S. H. NOURSE,

JESSIE C. BRODIE.