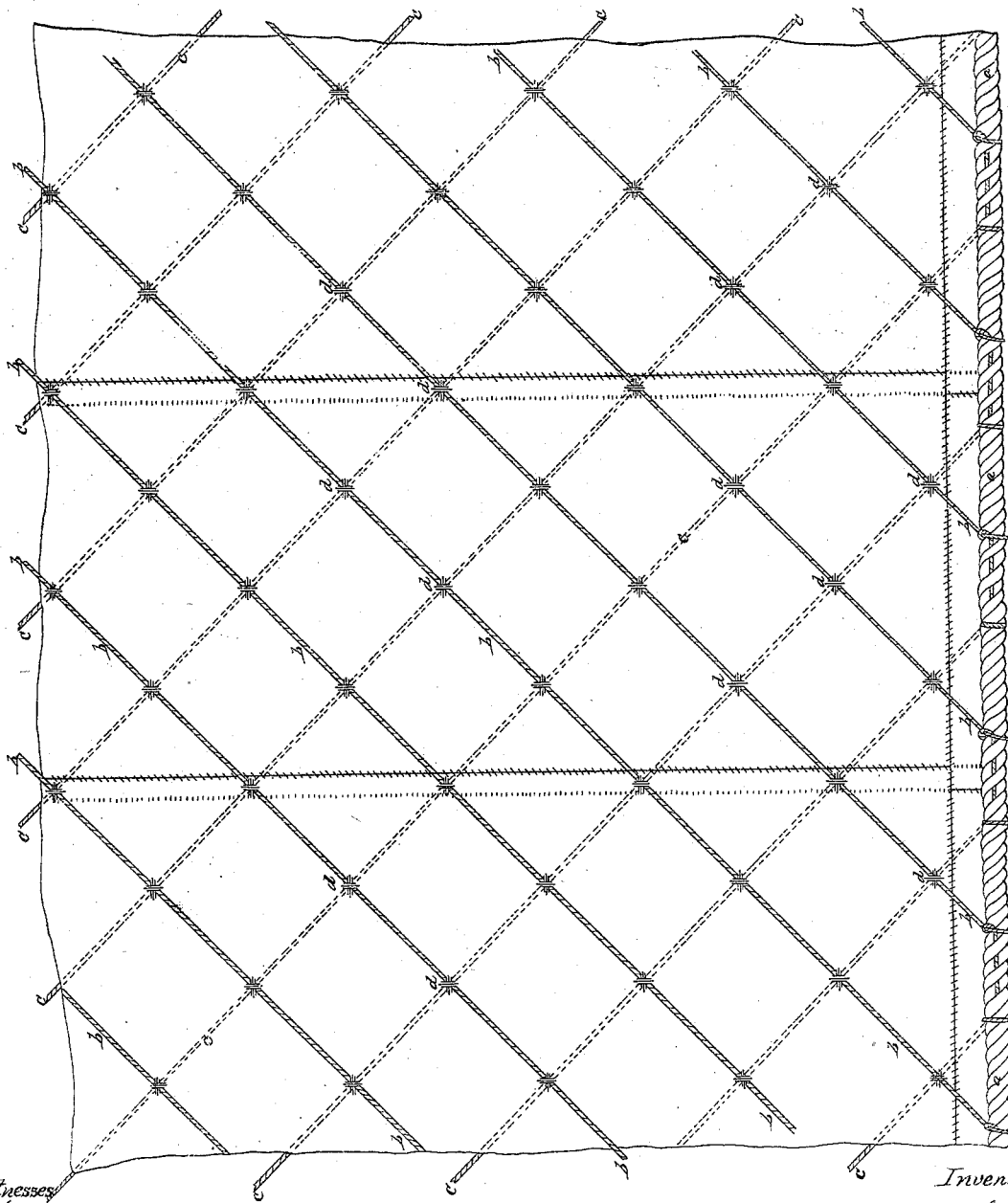
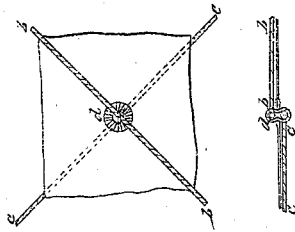


A. Trail.
Sails & Rigging
N^o 3,750. Patented Sept. 24, 1844.



Witnesses
John Muck
Wm. Harrison

Inventor:
A. Trail

UNITED STATES PATENT OFFICE.

ARCHD. TRAIL, OF BLOOMSBURY, ENGLAND.

METHOD OF STRENGTHENING THE SAILS OF SHIPS AND OTHER VESSELS.

Specification of Letters Patent No. 3,756, dated September 24, 1844.

To all whom it may concern:

Be it known that I, ARCHIBALD TRAIL, a subject of the Queen of Great Britain, and now residing at Great Russell street, Bloomsbury, in the county of Middlesex, England, have invented or discovered new and useful Improvements in the Manufacture of Sails for Ships and other Vessels; and I, the said ARCHIBALD TRAIL, do hereby declare that the nature of my said invention and the manner in which the same is to be performed are fully described and ascertained in and by the following statement thereof, reference being had to the drawing hereunto annexed and to the figures and letters marked thereon—that is to say:

My invention consists of strengthening sails for ships and other vessels by the application of cords or lines or bands in such manner as to sustain the sails when pressed on by the wind and thereby prevent the canvass of which the sails are constructed from being torn the cords or lines or bands so applied acting as stays to the sails. And in order that the invention may be fully understood and readily carried into effect I will proceed to describe the means pursued by me.

The manufacture of sails for ships and other vessels being well known it will not be necessary for me to enter into a description thereof more particularly as my invention does not interfere with the making of sails in the ordinary manner but consists of applying to sails certain additions in order to obtain strength and by such means produce sails of a greatly improved manufacture less liable to injury than sails as at present constructed.

Description of the drawing.—The drawing represents a portion of a sail which will enable me to explain my invention and although sails differ in shape the portion of a sail shown in the figure will represent a piece cut out of any sail made according to my invention where the bolt rope at the edge runs parallel with the selvages of the cloth but the description herein given is equally applicable to triangular and other shaped sails.

The figure of the drawing shows parts of three cloths of a sail having a bolt rope *a*, affixed at the edge as is usual.

b, b, b, and *c, c, c,* are strengthening cords or lines or bands affixed at their ends securely to the bolt ropes with which the sail is skirted round and these strengthening

cords lines or bands are at intervals attached to the canvass of the sail as is shown at *d, d*. The strengthening cords lines or bands *b, b, b,* are applied on one side of the sail and the strengthening cords or lines *c, c, c,* are applied on the other side of the sail hence it will be seen that a sail when so constructed according to my invention will be sustained and supported by the strengthening cords lines or bands and the bolt ropes to which they are affixed for it will be evident that as the wind presses the canvass the pressure will be received by the strengthening cords or lines or bands and the canvass will thereby be supported and relieved from the strain.

The ends of the strengthening cords lines or bands are to be securely fastened to the bolt ropes and in doing so care is to be observed that the lengths of such cords lines or bands are to be such that when the sail is full of wind the strengthening cords or lines may on the convex side of the sail touch and support the sail without producing any bagging of the canvass and I prefer that in attaching the strengthening cords or lines to the canvass of the sail at intervals *d, d,* that the attachments should be such that the strengthening cords or lines may slide through the points of attachment though that is not absolutely necessary. I form these attachments at intervals by sewing through the canvass and at the points *d, d,* forming loops over the strengthening cords or lines through which these lines may be drawn or slid or I form holes through the canvass at the points *d, d,* which I strengthen and stitch around as is well understood when making holes for other purposes in sails and through these holes I pass loops of strong cord bands or lines such as I use for the strengthening cords bands or lines and through these loops on either side of the sail I pass the cords or lines *b, c,* or these attachments may be made in any other convenient manner the object being to attach the strengthening cords band or lines at such intervals as to retain them in their places on the surfaces of the canvass of the sails and it will be evident that by such means the canvass will not be so liable to be torn as at present when under a great press of wind the greater strain being sustained by the strengthening cords bands or lines *b, b,* and *c, c,* together with the bolt ropes and the canvass being supported in many places can

not be so prejudicially strained as is now the case where the sails are only sustained by the bolt ropes at their edges.

I would remark that the ordinary linings or strengthenings of canvass now commonly used on the "leeches" and middle of a sail may be used in conjunction with my improvements.

Having thus described the nature of my invention I would have it understood that I do not confine myself to the precise details herein described and it will be evident that the directions of the strengthening cords band or lines may be varied so long as the

peculiar character of my invention be retained, but

What I claim is—

The mode of manufacturing sails by applying strengthening cords bands or lines crossing each other on opposite side of the sail in such manner as to support the canvass at intervals as described and thereby give additional strength to sails for ships and vessels.

ARCH. TRAIL.

Witnesses:

JOHN ALCOCK,
G. M. HARRISON.