J. S. Foster,
Sails & Rigging.

No. 15,732. Patented Sept. 16, 1856.

Fig: 1.

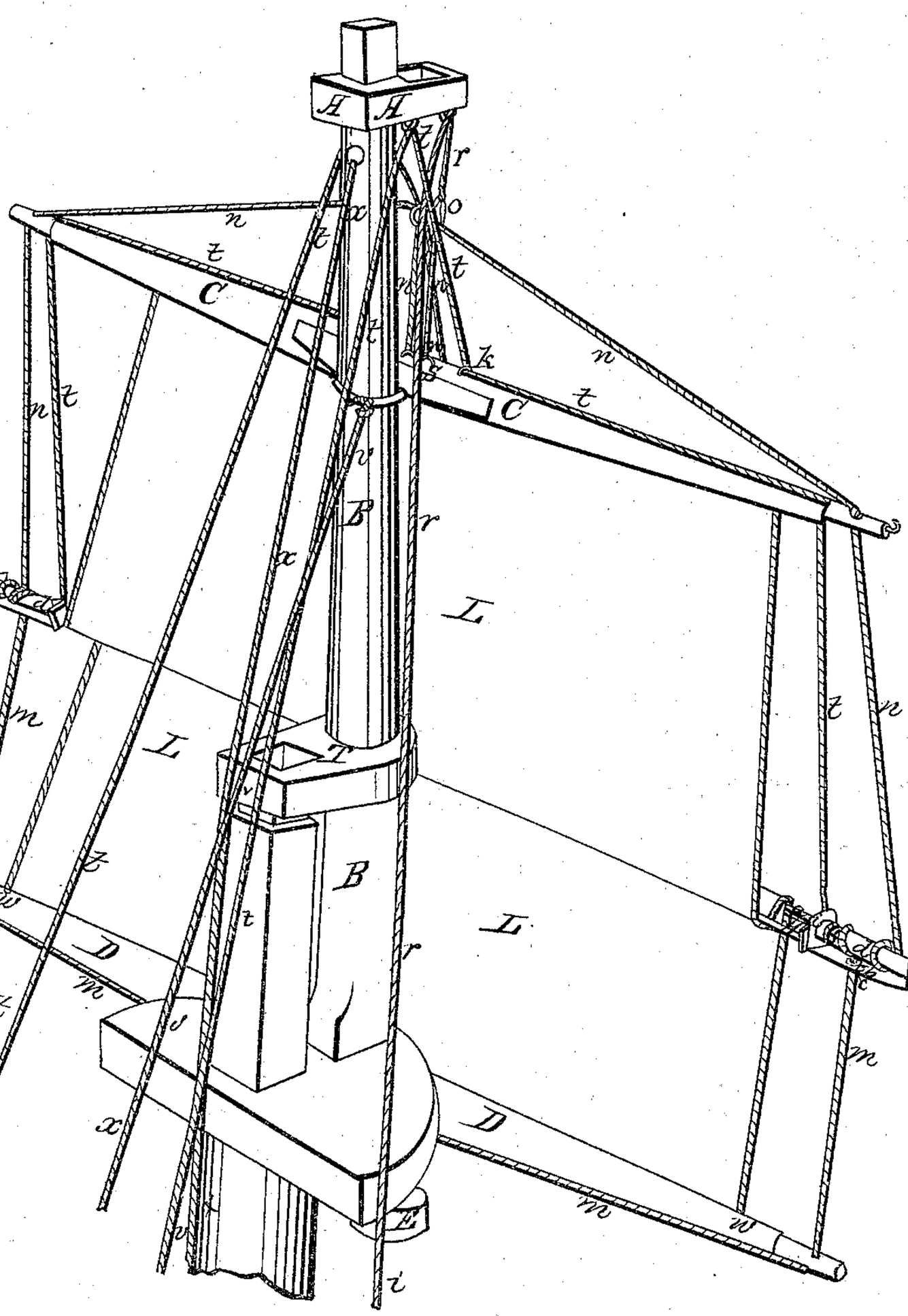
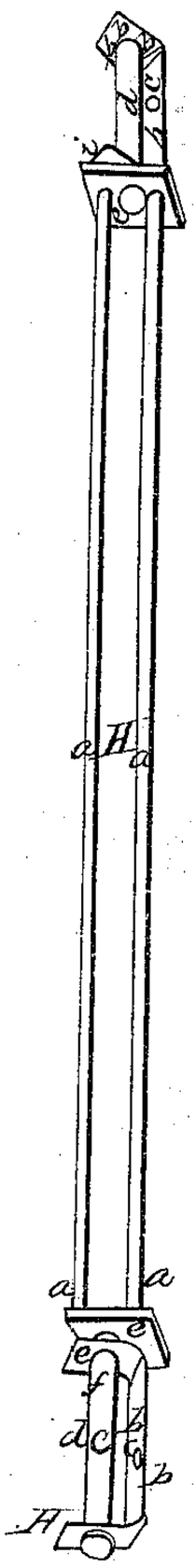


Fig: 2.



UNITED STATES PATENT OFFICE.

JOSEPH S. FOSTER, OF BUFFALO, NEW YORK.

REEFING SHIPS' SAILS UPON EXTRA YARDS.

Specification of Letters Patent No. 15,732, dated September 16, 1856.

To all whom it may concern:

Be it known that I, J. S. FOSTER, of Buffalo, in the county of Erie and State of New York, have invented a new and Improved Mode of Reefing and Furling Sails of Vessels; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 is a general view of the topmast, weight, trestletree, topsail yard, lower yard topsail, the folding rod, with half a revolution in reefing the sail, with as much of the ropes and lower mast as is necessary to show the operation of reefing and furling. Fig. 2, is a view of the folding rod detached with a band or plate at each end, in which it revolves.

My improvement relates to the reefing and furling of sails upon an extra yard by the lowering of the upper yard, and consists in making the upper yard of two pieces placed about midway between the upper and lower yard, the sail passing between the two pieces, and which is so operated by certain devices hereinafter described, that the sail is reefed and furled in two directions.

My improvement may be applied to sails of the usual form and construction, and which may be attached to the yards by any of the ordinary means, the masts and yards being constructed and arranged in the usual manner, but in order to avoid the difficulties arising from going up on the topsail yard C, Fig. 1, to reef and furl the sails, I have provided adjustable folding yard, seen at H, H, H′, Fig. 2, which is constructed and arranged as follows: Two rods *a*, *a*, are attached to the two end plates *e*, *e*, to which plates are secured the two arms *d*, *d*, and to which are connected the blades, or plates, *b*, *b*. In these bands the folding rods H, revolve. These devices as arranged comprise the folding yard, Fig. 2. The topsail L, Fig. 1, passes through the yard between the rods *a*, *a*. The ropes *m*, *m*, are affixed to the bands *b*, *b*, at *c*, *c*. These ropes extend from the two bands to the lower yard D, through which they pass at or near the ends, and from thence following the yard, to or near the middle of which they pass through a pulley, and from thence to the deck. To the ends of the ropes *m*, *m*, is attached a weight E, or its equivalent. The lines *n*, *n*, start from the two arms *d*, *d*, at the places *f*, *f*, to which places these lines are secured, and around the arms the lines form a desired number of turns, and then pass through the topsail yard C, at or near the ends, from which ends they pass through the movable pulley *o*, down to the topsail yard, where they are attached or made fast by the staple S. From the bands *b*, *b*, start the ropes *t*, *t*, at the points *i*, *i*, or other convenient place, and pass through the topsail yard C, to pulleys at *k*, *k*, through which they pass, from thence to the two revolving pulleys in the trestletree A, and then to the deck. The rope *r*, is connected to the movable pulley *o*, from which it passes to a pulley in the front or other convenient part of the trestletree A, and from thence to the deck. The halyards *x*, *x*, are applied as in the ordinary manner, being connected at S, and passing through the topmast B, and then to the deck. The rope *v*, is attached to the yard C, at or near the center or most desirable part thereof and from thence to the deck.

On lowering the topsail yard C, and sail L, a tension and drawing is caused on the reefing lines *n*, *n*, operating through the pulleys *o*, which drawing on the circumference of the arms *d*, *d*, of the folding yard H, causes this yard to revolve, which consequently folds up the sail, as may be required, in two directions, toward the top, and lower yards, C, and D. Half the number of furls will reef a sail in this way than is required by a single extra yard at the end. If the slacking of the halyards *x*, is not sufficient to allow the topsail yard C, and sail L, to descend it can be accomplished by applying power to the down-haul line *v*. When the whole sail L, is required to be furled after the topsail yard is on the cap T, it can be performed by liberating the sail L, at the points W, W, and by pulling on the ropes *r*, which causes the drawing on the ropes *n*, *n*, which ropes act as aforesaid on the arms *d*, *d*, of the folding yard, which is caused to turn and thereby reef and furl the sail. By pulling on the ropes *t*, *t*, they cause the yard H, to ascend under the topsail yard C, and the ropes *m*, *m*, which are attached to the bands *b*, *b*, must necessarily follow, sufficient ropes *m*, *m*, being supplied for that purpose, to which ropes is attached the weight E. This weight is applied during the operation of reefing and furling, for the purpose of keeping the bands *b*, *b*, in position desired. The rope *r*, is for the purpose of conducting

the pulley *o*, in any proper position, which pulley is used for the regulation of the ropes *n*, *n*.

The manner in which sails are generally furled and reefed occasions much time and labor, and in many instances by loss of life, by being obliged to go aloft, as it cannot be done on deck. Vessels are also lost by the delay occasioned in reefing and furling sails by the ordinary method when overtaken by a sudden gale. It is also dangerous and difficult, to reef or furl the sails by the ordinary means when they are frozen. These evils and difficulties may be obviated by the application of my improvement.

What distinguishes my improvement from all others is, first, the advantage of greater support to the sail L, by its being secured to the topsail yard arms in the ordinary manner and also to the lower yard, which is not the case with the single extra yard suspended from the upper yard, and being attached only at the extreme ends, which leaves the central portion of the yard and sail not well supported; second, my improvement may be applied to any vessel rigged in the ordinary manner without disconnecting the sail from the upper or lower yards. This gives an increased amount of strength to the sail at all times and which is much needed in high wind, and in low wind it is important that the whole space between the upper and lower yards should be filled with sail, which is not the case with the extra suspended yard, as there must be more or less open space between the extra yard and topsail yard. Another advantage in my improvement is, that it does not interfere with the bracing of the yards by coming in contact with the stays when sailing on the wind.

What I claim as my improvement and which I desire to secure by Letters Patent is—

The double yard H, H, H, or extra yard of two pieces placed about midway between the upper, and lower yards, the sail passing between the two pieces, operating in the manner and for the purpose as herein set forth.

JOSEPH S. FOSTER.

Witnesses:
WILLIAM T. BARNES,
ROBERT A. BARNES.