

No. 120,806.

Improvement in Reefing Sails.

No. 120,806.

Patented Nov. 7, 1871.

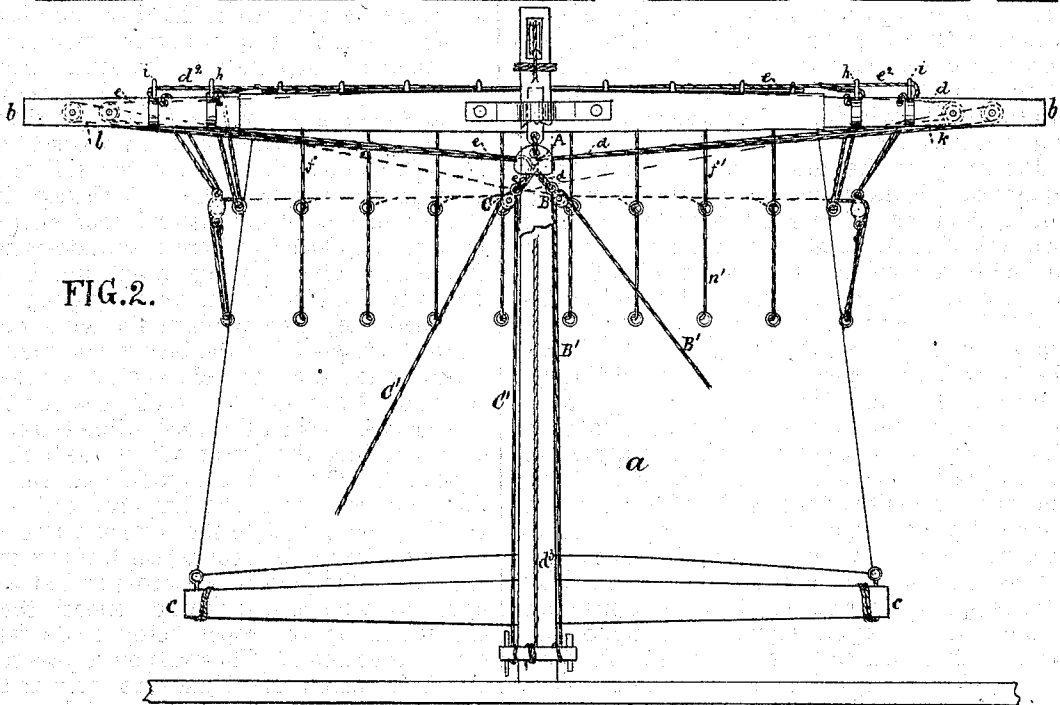
FIG. 1.

FIG. 3.

FIG. 1.



FIG.2.



G. Mathys.
Colon Lemon

John E. Worthman

✓ PER

Attorneys.

UNITED STATES PATENT OFFICE.

JOHN EDWARD WORTHMAN, OF MOBILE, ALABAMA, ASSIGNOR TO HIMSELF,
ORVILLE F. CAWTHORN, AND RANDOLPH G. READING, OF SAME PLACE.

IMPROVEMENT IN REEFING SAILS.

Specification forming part of Letters Patent No. 120,806, dated November 7, 1871.

To all whom it may concern:

Be it known that I, JOHN EDWARD WORTHMAN, of Mobile, in the county of Mobile and State of Alabama, have invented a new and Improved Method of Reefing Sails; and I do hereby declare the following be a full, clear, and exact description of the same, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a front elevation of a square sail having my apparatus applied. Fig. 2 is a rear elevation of the same, and Fig. 3 is an enlarged front view of the metal and rope grummet.

My invention has for its object to provide, for the use of navigators, an improvement in apparatus for effecting the reefing of the sails of a vessel from its deck without the necessity of any of the crew being sent aloft, and without necessitating the heaving to of the vessel or the changing of her course.

Referring to the drawing, *a* is an ordinary square sail; *b*, the upper yard; *c*, the lower yard; and *d*, the mast. The sail has, in this instance, two sets of reef-points. *A* is the main block, attached to the under side of the yard. *B* is the block for the upper set of reef-tackle and points; and *C*, the block for the lower set, through which blocks pass halyards *B' C'*, respectively. From the block *B* two ropes, *d e*, pass upward through the main block *A*, of which the rope *d* passes to the starboard end of the yard and the rope *e* to the port end, both ropes running around sheaves in the yard, and each extending thence to the opposite extremity of the yard. The reef-points *f*, constituting the port half of the upper set, are attached at their upper ends to the rope *d*, and the reef-points *f'*, constituting the starboard half of the upper set, are attached at their upper ends to the rope *e*. At points near the contiguous upper corners of the sail the ropes *d e* each divide into two branches, *d¹ d²* and *e¹ e²*. The branch *d¹* passes through a sheave, *h*, on the yard, thence downward through the ear-ring *g*, and thence back to the yard, where its extremity is fastened. The branch *d²* passes through an eye-bolt, *i*, on the yard, thence downward through a pendant-block, *j*, and thence back to the yard, where it is likewise fastened. The branches *e¹ e²* are similarly disposed at the other edge of the sail. Therefore, when the upper yard is lowered, as it always is in reefing, and the halyard *B'* pulled

upon from the deck, the ropes *d e* move along the yard in opposite directions, drawing the reef-points *f f'* outboard through a row of grummets in a strip of canvas, fastened to the yard in the same way that the sail is fastened, thus causing the reef-points to bind the slack portion of the sail in folds on the upper side of the yard. At the same time the branches *d¹ e¹* haul out the earings of the upper reef to their proper places on the yard, and the branches *d² e²* haul the pendant-blocks *j* up and out to points on the yard where they will be in the proper positions for taking in or shaking out the second reef. Thus the first reef is taken in without the stirring of a man from the deck, and it can be done without the ship swerving a point from her course and in any state of the wind. From the block *C* ropes *k l* pass upward, pursuing the same course as the ropes *d e*, except that when the first reef is shaken out the ropes *k l* stretch at angles across the front of the sail and pass through the pendant-blocks *j*, thence through the earings *m* of the second reef, and thence back to the blocks *j*, where their extremities are fastened. When, during the taking in of the first reef, the blocks *j* are drawn tightly against the yard they then perform the same office toward the ropes *k l* as the blocks *h* do toward the ropes *d e* and their branches—that is, they cause the ropes *k l* to haul the earings *m* out to their proper positions on the yard, while the halyards *C'* are pulling the lower set of reef-points *n n'* outboard. The reefs are quickly shaken out by the wind whenever the halyards are lowered. On the same principle the reefs of a fore-and-aft sail are taken in by reef-tackle leading through sheaves at the jaws of the boom and at its after end, with a block and tackle beneath the beam to haul in by, the ropes being made fast to a cleat on the boom. The reef-points pass through metal grummets *o*. These are surrounded by rope grummets *p*, and the metal grummets clunched over both the sail and the rope grummets. The rope grummets have projecting loops *q*, to which the ends of the reef-points are attached. This construction is for the purpose of preventing the strain of the reef-points from tearing the sail. The reef-points extend from the loops *q* downward and pass through the next lower row of grummets, thence upward on the other side of the sail to and through the next

upper row of grummets, the extremities of the reef-points being attached to the draw-ropes on the front side of the sail. This arrangement prevents the reef-points from hanging loose and flapping and wearing the sail, as they do under the present system. Sails can be furled on the same principle here described for reefing.

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

1. The combination, with a sail and yard, of draw-ropes *d e* pulling in opposite directions, reef-points *f f'*, one half attached to one draw-rope and the other half to the other draw-rope,

main block A, lower block B, and halyard B', as specified.

2. The combination, with the foregoing, of the branches *d¹ d² e¹ e²*, earings *g m*, pendant-blocks *j*, draw-ropes *k l*, and reef-points *n n'*, as described.

3. The combination, with a sail and the draw-ropes herein described, of reef-points passing through the grummets and attached to the loops *q*, as explained.

J. E. WORTHMAN.

Witnesses:

SOLON C. KEMON,

CHAS. A. PETTIT.

(138)