

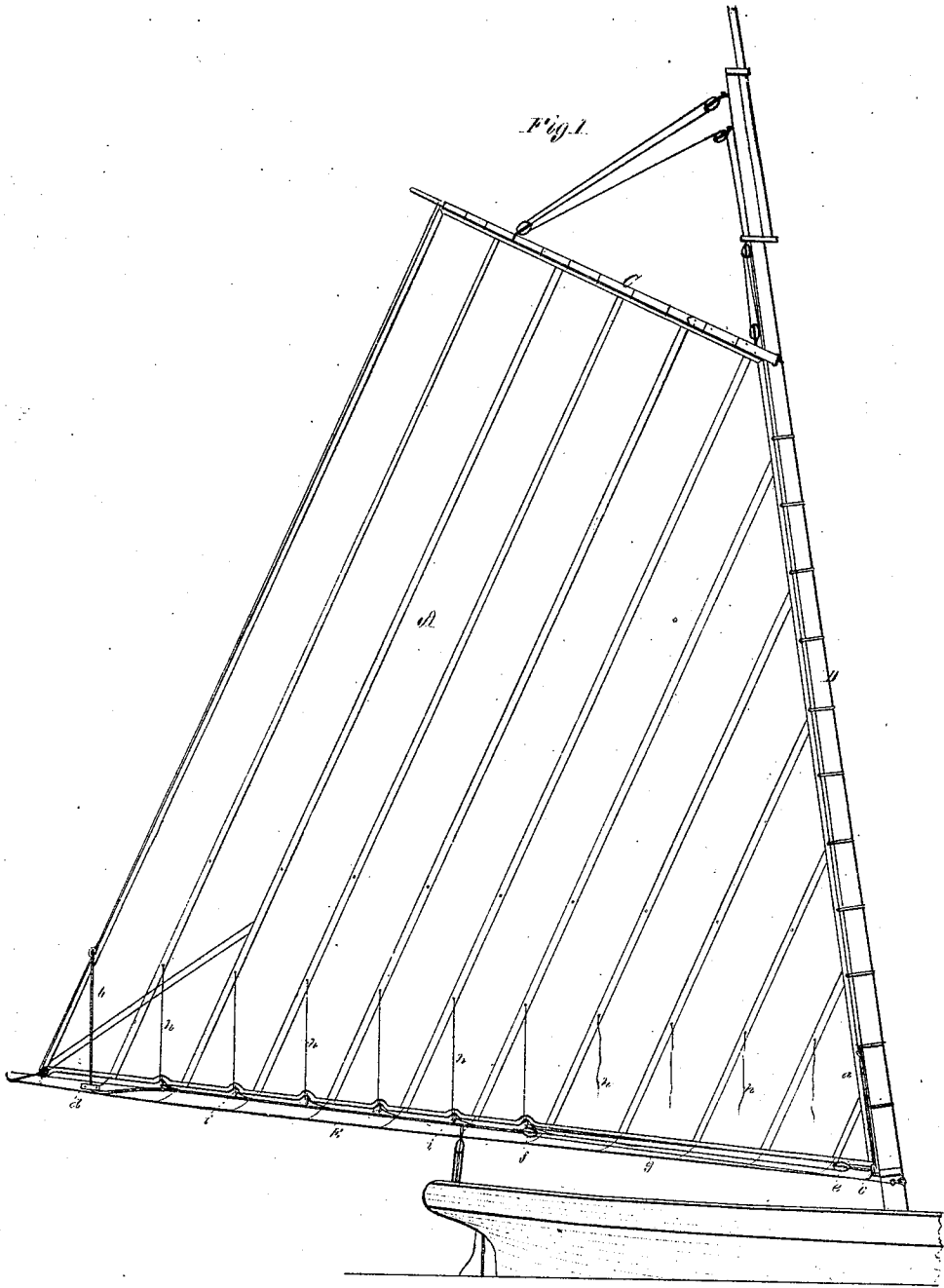
N. W. Rich,

2 Sheets, Sheet 1.

Sails & Rigging.

No. 102,158.

Patented Apr. 13, 1870.



Witnesses.  
L. S. Piper  
J. Brown

Nathaniel Wiley Rich  
by his attorney,  
H. H. Hedy

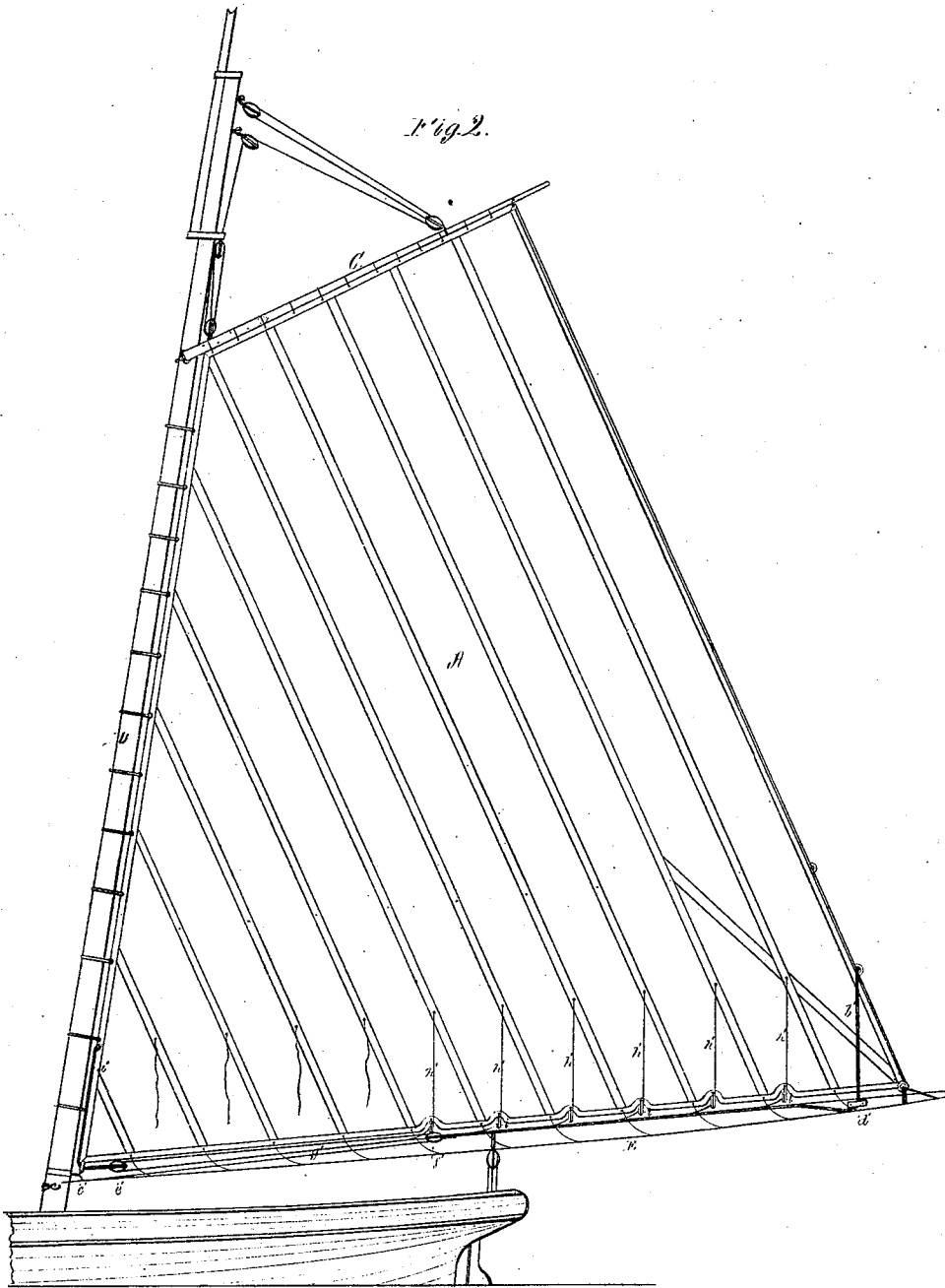
N. W. Rich,

2, Sheets, Steel 2,

Sails & Rigging.

No. 102,158.

Patented Apr. 19, 1870.



Witnesses  
S. N. Phipps  
J. Brown

Nathaniel Wiley Rich  
by his attorney  
H. Brady

# United States Patent Office.

NATHANIEL WILEY RICH, OF SWAMPSCOTT, MASSACHUSETTS.

Letters Patent No. 102,158, dated April 19, 1870.

## IMPROVEMENT IN APPARATUS FOR REEFING SAILS.

The Schedule referred to in these Letters Patent and making part of the same.

To all persons to whom these presents may come:

Be it known that I, NATHANIEL WILEY RICH, of Swampscott, of the county of Essex and State of Massachusetts, have made a new and useful invention, having reference to the Reefing of Sails of Navigable Vessels; and do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is an elevation of one side, and

Figure 2, an elevation of the other side of a mainsail, its mast, boom, and gaff with my means of reefing such sail applied to it.

In the drawings—

A denotes the sail;

B, the boom;

C, the gaff; and

D, the mast, the application of the sail to the gaff and the mast being in the ways usually practiced.

In carrying out my invention there is to be fastened to the two opposite leeches of the sail, two lines or ropes, *a b*, at the height of the reef to be taken.

These ropes are to be led through guides *c d*, one of which is arranged at or near the heel of the boom, and the other at a short distance from its toe, or in other words directly underneath the point of attachment of the rope to the leech of the sail.

Each of such ropes at its free end is fastened to one of two blocks *e f*.

Another or tackle rope, *g*, secured at one end to the aft block, is led through the other or forward block, and partly around its sheave and next to and through the other or aft block, the said rope and the two blocks constituting a tackle.

The several reef-points or lines *h h h*, with the exception of a few, *h<sup>2</sup>*, which may be inboard, I lead through eyes *i i i* fastened to the lower edge of the sail.

Each of these points or ropes, after having been led through one of the said eyes, is to be fastened to the hauling line *b*.

On pulling on the tackle-rope and lowering the gaff, both leeches will be simultaneously drawn down, and the sail will be reefed.

To effect, however, the brailing of the part so reefed, it is advisable to have a second set of reefing-tackle applied to the opposite side of the sail, such being represented in fig. 2, where the tackle-rope thereof is shown at *g'*, the reef-points at *h' h'*, the latter being led through the eyes *i i i*, and fastened to a brailing-line, *b'*.

The two brailing-lines attached to the sail-leeches

are shown at *a'* and *b'*, their blocks at *e' f'*, and their tackle-rope at *g'*, the whole being applied together to the boom, the sail, and the reef-points *h<sup>2</sup>* in manner as hereinbefore described with respect to the reefing-tackle of the opposite side of the sail.

From the above description it will readily be seen that a draught on the tackle-lines *g g'* will simultaneously bring down both leeches of the sail, as well as the part or parts of the sail to be reefed, and, when the sail is reefed, the portion reduced will be brailed by the two sets of reef-points.

The importance of having a good means of quickly reefing a mainsail, especially when the boom is long and extends far aft of the stern of the vessel, is well understood by mariners, as many valuable lives are yearly lost for the want of such.

My reefing-tackle operates to excellent advantage, and enables a sail to be reefed from the deck with great facility and in a few moments.

From the above it will be seen that between the mast or forward leech, and each of the series of reefing lines *h* or *h'*, the first of which is in close contiguity with the stern of the hull, there is a series of common tying reef-points, *h<sup>2</sup>*, not connected with either of the leading-lines *a b*, or *a' b'* the reefing-lines or points which go through the eyes, and are attached to each of the ropes *b* or *b'*, being applied mostly to that part of the sail which is outboard.

By using common reef-points on that part of the sail which is directly over the deck, and, by having the reefing-gear to be operated by the lines *b b'* applied to that part of the sail which projects beyond the stern, we gain an advantage, as we save, by such, much friction and wear, that would otherwise result, and are enabled to operate the sail quicker and better.

I therefore make no claim to the invention as described in the United States Patent No. 26,915, dated June 24, 1860.

I claim the arrangement of the series of common tying reef-points *h<sup>2</sup>* applied to the inboard part of the sail, with the series of reefing-points applied to the outboard parts thereof, their leading-lines *a* and *b* affixed to the fore and aft leeches of the sail, and the two blocks *e f* and tackle-rope *g* thereof, the whole being substantially as described.

NATHANIEL WILEY RICH.

Witnesses:

R. H. EDDY,  
J. R. SNOW.