

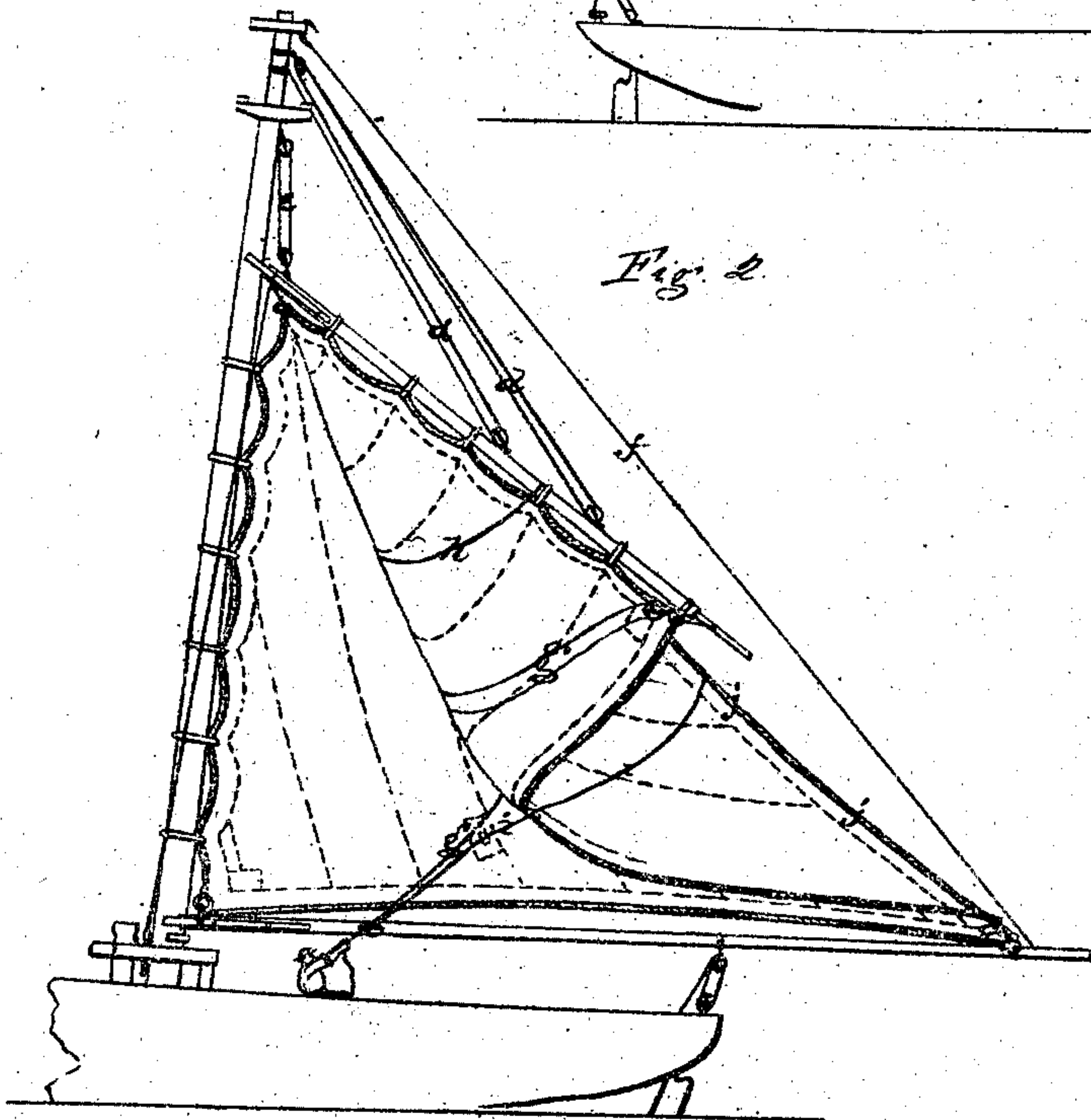
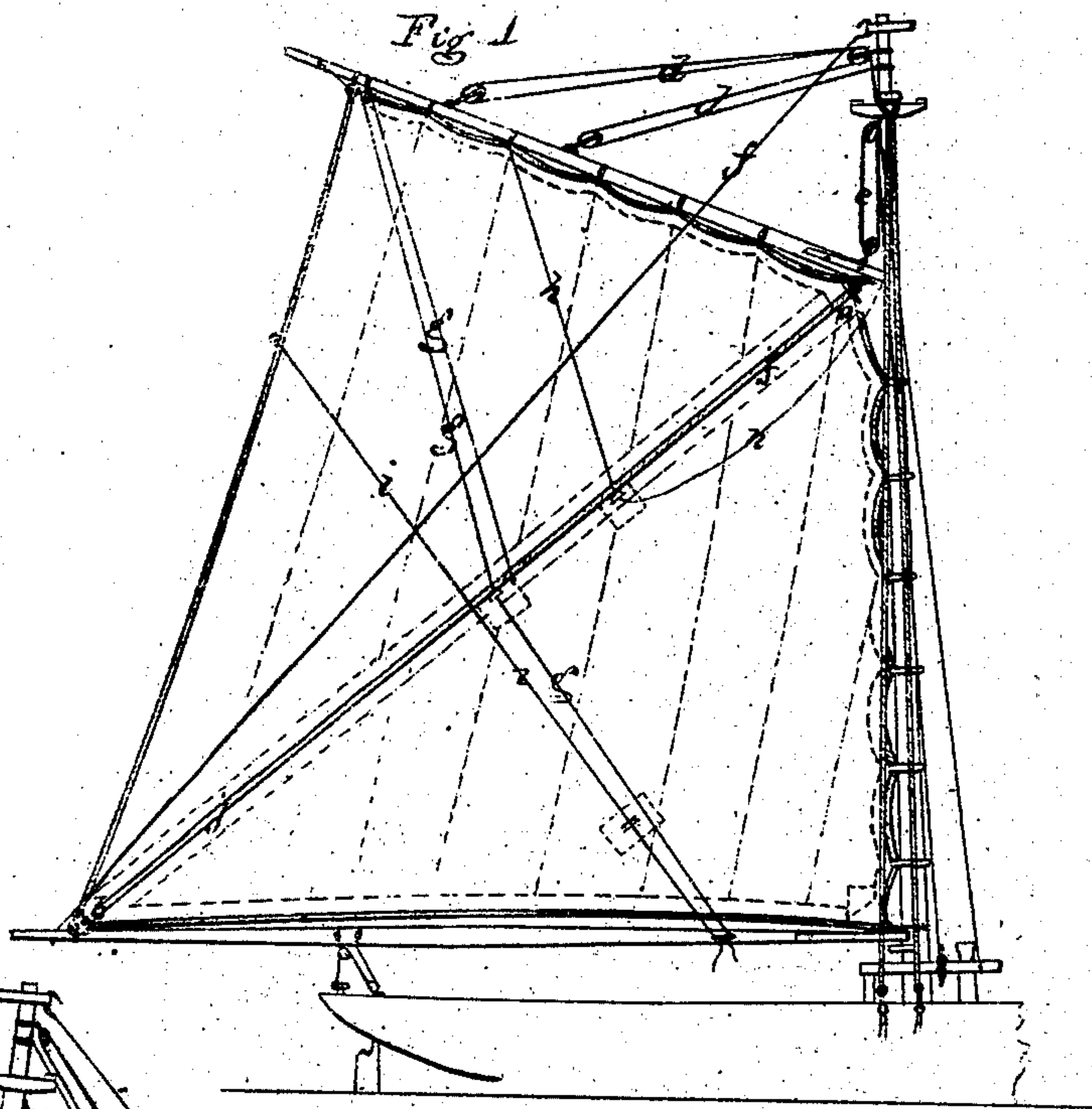
*R. C. Denham,*

*2 Sheets. Sheet. 1.*

*Sails & Rigging.*

*No. 78,267.*

*Patented May 26, 1868.*



*Witnesses*  
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*by his Att'y*  
*Ernest Halsted & Peck*

*R. C. Denham,*

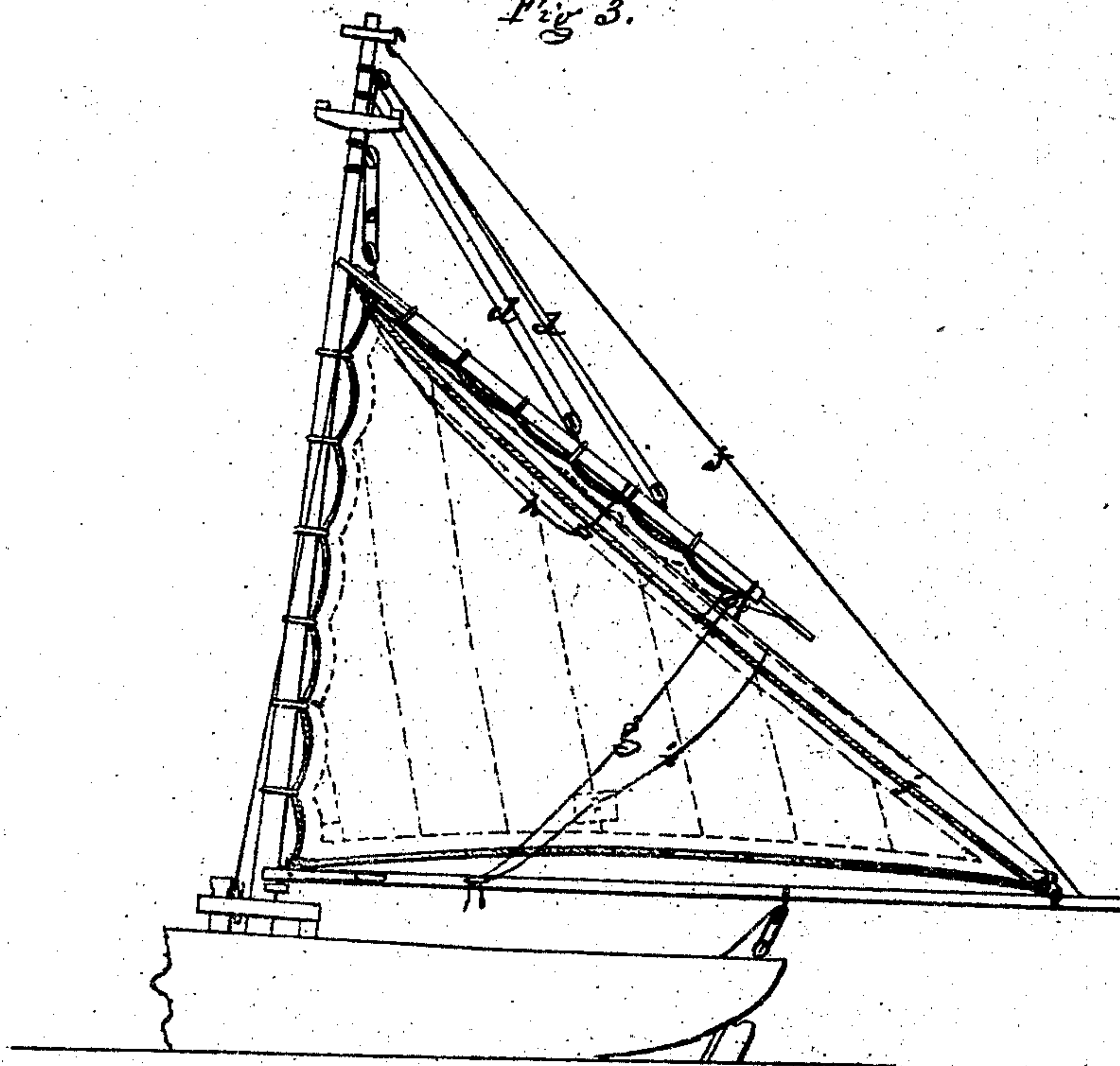
*2 Sheets, Sheet 2.*

*Sails & Rigging.*

*No. 78,267.*

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*Fig 3.*





# United States Patent Office.

R. C. DENHAM, OF RICHMOND, MAINE.

Letters Patent No. 78,267, dated May 26, 1868.

## IMPROVEMENT IN REEFING FORE-AND-AFT SAILS

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

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, R. C. DENHAM, of Richmond, in the county of Sagadahoc, in the State of Maine, have invented an Improvement in Reefing Fore-and-Aft Sails; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practise it.

This invention relates to an arrangement of means for reefing such fore-and-aft sails as have a hoisting-gaff which slides up and down on the mast, and are furled on the boom.

In this invention, such sails are reefed by dropping the peak of the gaff to a diagonal line drawn from the throat of the sail to its clew, and securing the gaff in that position to a re-enforcing band or rope, secured to the sail on said line, which, as it were, separates the sail into two parts, each triangular.

This reef is very effective, because it reduces the head of the sail at once, so as greatly to lessen the careening effect of the wind on the mast, by lowering the centre of the wind-pressure much more than the reefing of an equal area of sail in the ordinary way.

In reefing a sail in accordance with my invention, the throat and clew remain undisturbed, and as the peak-halyards are slacked, the belly of the upper triangle of the sail blows to leeward, between the gaff and the diagonal re-enforce, and after the lines which secure the gaff on the diagonal re-enforce are made taut and secure, the slack of the upper triangle of the sail is, by a line made fast to the leech-bolt rope, hauled down on the lee surface of the lower triangular part of the sail.

Figures 1, 2, and 3 represent views of a schooner's mainsail arranged to embody my invention.

Fig. 1 shows the sail fully spread.

Fig. 2 represents the sail as reefed, and as it appears on the lee side, and

Fig. 3 represents the weather side of the sail when reefed.

The boom, gaff top-lift, throat, and peak-halyards remain as is usual with sails of this description, but the sail is braced or re-enforced on a diagonal line from the throat, at *a*, to the clew, at *b*, with canvas or rope, or both.

At or near the peak of the gaff, on each side thereof, there is an eye or a block, *c*, through which lines made fast on the re-enforced diagonal of the sail pass, and are belayed on the boom; and other lines, made fast to the gaff, about one-third of its length from the peak, pass through eyes or leaders secured to the diagonal re-enforce of the sail, to eyes, blocks, or leaders on the gaff, near its throat, from which they pass to belaying-cleats or pins near the foot of the mast.

The peak-halyards are marked *d*; the throat-halyards, *e*; the top-lift, *f*; the down-haul operating near the peak of the gaff, *g*; the other gaff down-haul, *h*; and the lines which are secured to the leech of the sail, (to haul the slack of the upper triangle well forward on the lee side,) *i*, and the diagonal re-enforce, *j*.

To reef the sail, slack the peak-halyards *d*, and haul on the weather down-hauls *g* and *h* till the gaff lies on the diagonal line of the re-enforce *j*. Then belay the down-hauls, and haul on the lee line *i* till the slack-leech is brought well forward, and then secure the end of the peak-halyards.

From the foregoing, nautical men will at once observe that fore-and-aft sails can be reefed with dispatch, and with but few hands, and without seeking shelter under which to perform the reefing operation, or without lowering the sail.

The diagonal re-enforcing strengthens the sail, so as to permit securing on the diagonal line the gaff down-hauls, and prevents the gaff from tearing the sail.

I claim combining with the diagonal re-enforced line of a fore-and-aft sail, and with the gaff of such a sail, gaff down-hauls, and eyes or leaders, in the manner substantially as described, so as to secure the gaff to the aforesaid line in the act of reefing.

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Witnesses:

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