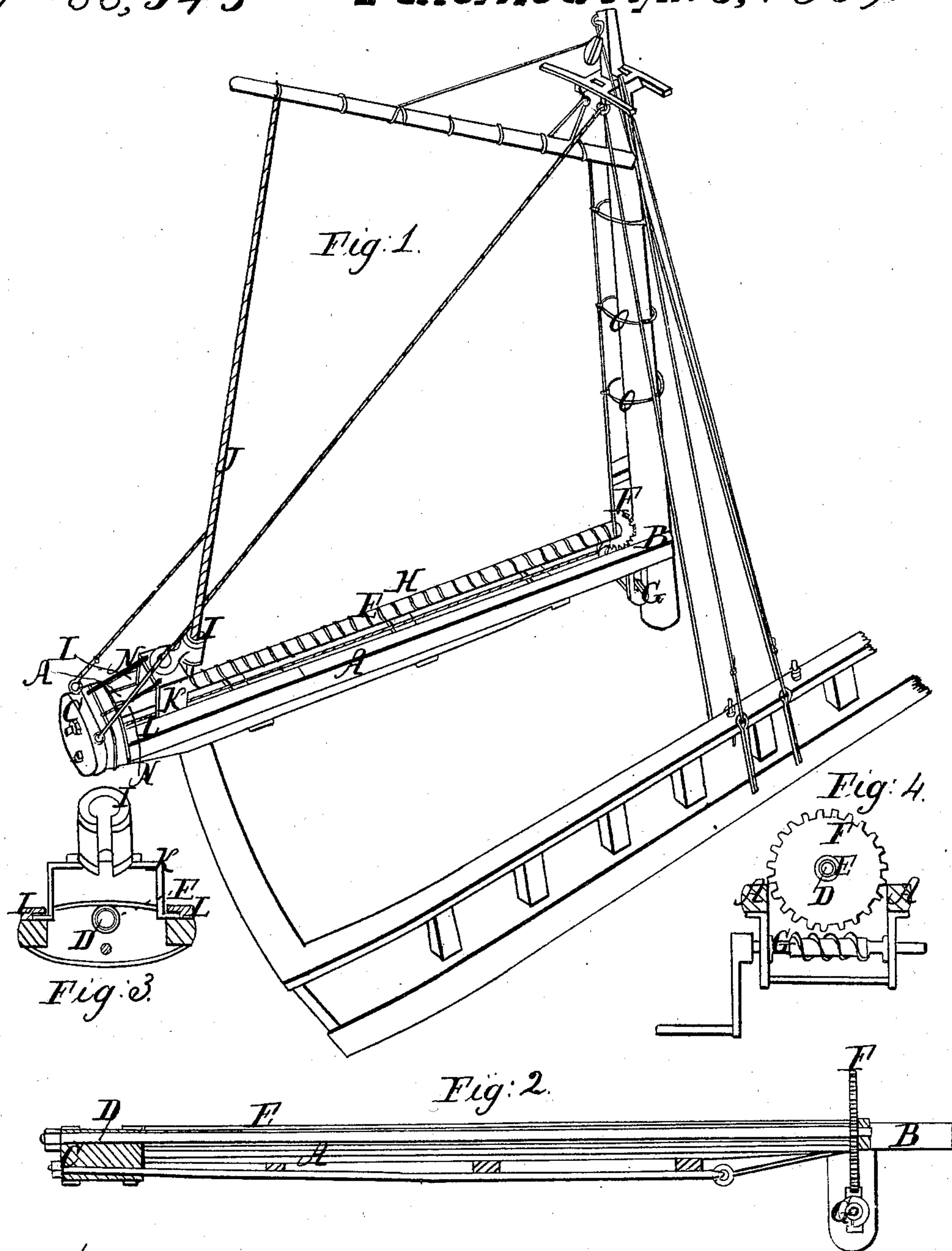


R. Chambers. Reefing Sails.

N^o 88,543

Patented Apr. 6, 1869.



Witnesses;
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ROBERT CHAMBERS, OF DETROIT, MICHIGAN.

Letters Patent No. 88,543, dated April 6, 1869.

IMPROVEMENT IN REEFING FORE-AND-AFT SAILS.

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

To whom it may concern :

Be it known that I, ROBERT CHAMBERS, of Detroit, in the county of Wayne, and State of Michigan, have invented a new and useful Improvement in Apparatus for Reefing Fore-and-Aft Sails; and I do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, and being a part of this specification.

Figure 1 is a perspective view of my apparatus attached to the main-sail of a vessel, which is partially in section.

Figure 2 is a vertical longitudinal section of the boom and its attachments.

Figure 3 is a front view of the guide to the after leach of the sail.

Figure 4 is a view of the apparatus for winding up or rolling up the sleeve attached to the bottom of the sail.

Like letters indicate like parts in each figure.

The nature of this invention relates to an improvement in apparatus for reefing fore-and-aft sails, so constructed that but little labor is required to perform the operation, which may easily and safely be done in all weather by a small number of men.

The invention consists of a shaft secured to and extending the whole length of the boom, the inner end of said shaft being secured to the jaw of the boom, which may be curved upon the inside, where it grasps the mast, with metal, if thought expedient, in order to strengthen the boom, and more securely hold the end of the shaft. The outer end of said shaft passes through and is secured to a plate secured at the outer end of the boom. Upon this shaft is sleeved a tube, to which is secured the bottom of the sail. This tube is provided at its end, near the mast, with a suitable geared wheel, and other appliances, for giving a rotary motion to said sleeve or tube, by means of which the sail is wound upon it, when the throat and peak-halyards are slackened away for the purpose. The boom should be made in two pieces, their ends being confined together by the jaws at the inboard-end, and at the opposite, or outboard-end, by the plate, to which is secured the shaft hereinbefore mentioned. This shaft should be secured between the two parts of the boom, between which a sufficient space should be left for the purpose. A guide, clasping and guiding the bolt-rope of the after-leach of the sail, is secured to a proper cross-head, working in suitable slides on the boom, by which means, as the sail is rolled upon the tube in reefing, the said sail is kept taut, and compelled to wind smoothly around the tube. The boom may be built of any material suitable to the purpose.

Having thus described the nature, I will now pro-

ceed to name and describe its various parts and their operation, as shown in the drawings.

A, in the drawings, represents the boom, made of two pieces, secured, as hereinbefore described, to the jaw B, at the inboard-end, and to the plate C at the outboard-end. Care should be taken, in the construction of this boom, to leave a space between the two parts sufficiently wide to allow of the reefing-apparatus to work between them.

D is a stationary shaft, the inboard-end secured to and through the jaw B, while the outboard-end is secured to and through the plate C. The position of this shaft is between the two parts composing the boom.

E is a hollow tube sleeved upon the stationary shaft D, and to its inboard-end is secured the gear-wheel F, to which motion is given by engaging with the worm-screw and crank G.

To this tube is fastened the bottom of the sail, H, in such a manner that when a rotary motion is given to the sleeved tube, the lower end of the sail will be wound upon the tube, thereby reefing the sail, and doing away with the necessity of reef-points, of hauling the sail aft, or throwing the vessel into the wind to enable the operators to reef the sail by the common way.

I is a guide, so constructed as to grasp the bolt-rope J of the after-leach of the sail, and is secured to the cross-head K, which moves and operates in the slides L, which are attached, one to each side of the boom.

N are ropes attached to the rear side of the cross-head, thence passing through proper blocks, are led forward, under the boom, to the mast M, and are intended to draw said cross-head and guide towards the outboard-end of the boom, when it is necessary to make all sail on the vessel.

The hoops O, which secure the fore part of the sail to the mast, should be so made that, when it is necessary to reef the sail, the hoops, as many of them as necessary, may be removed.

When it becomes necessary, with this apparatus, to reef a fore-and-aft sail, the throat and peak-halyards should be slackened up as much as necessary, and the sail wound upon the tube by the crank, screw, and wheel F. The lines N should also be cast off at the mast, when the guide will hold the bolt-rope and sail taut, and compel them to wind smoothly around the tube, the guide advancing upon the slides as fast as the inclination of the bolt-rope demands. After as much sail has been reefed as is necessary, the halyards may be tautened. When it is desired to make all sail again, the sail should be unwound from the tube by reversing the motion of the crank, hauling upon the halyards to take up the slackened sail, and, by means

of the ropes N, hauling the guide and cross-head back to its original position.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The guide I, cross-head K, and slides L, or their equivalents, when operating substantially for the purpose herein specified.

2. In connection with the above, the boom A, sta-

tionary shaft D, sleeved tube E, geared wheel F, and crank and worm-screw G, or their equivalents, when arranged, constructed, and operating substantially as and for the purposes herein described.

ROBERT CHAMBERS.

Witnesses:

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