

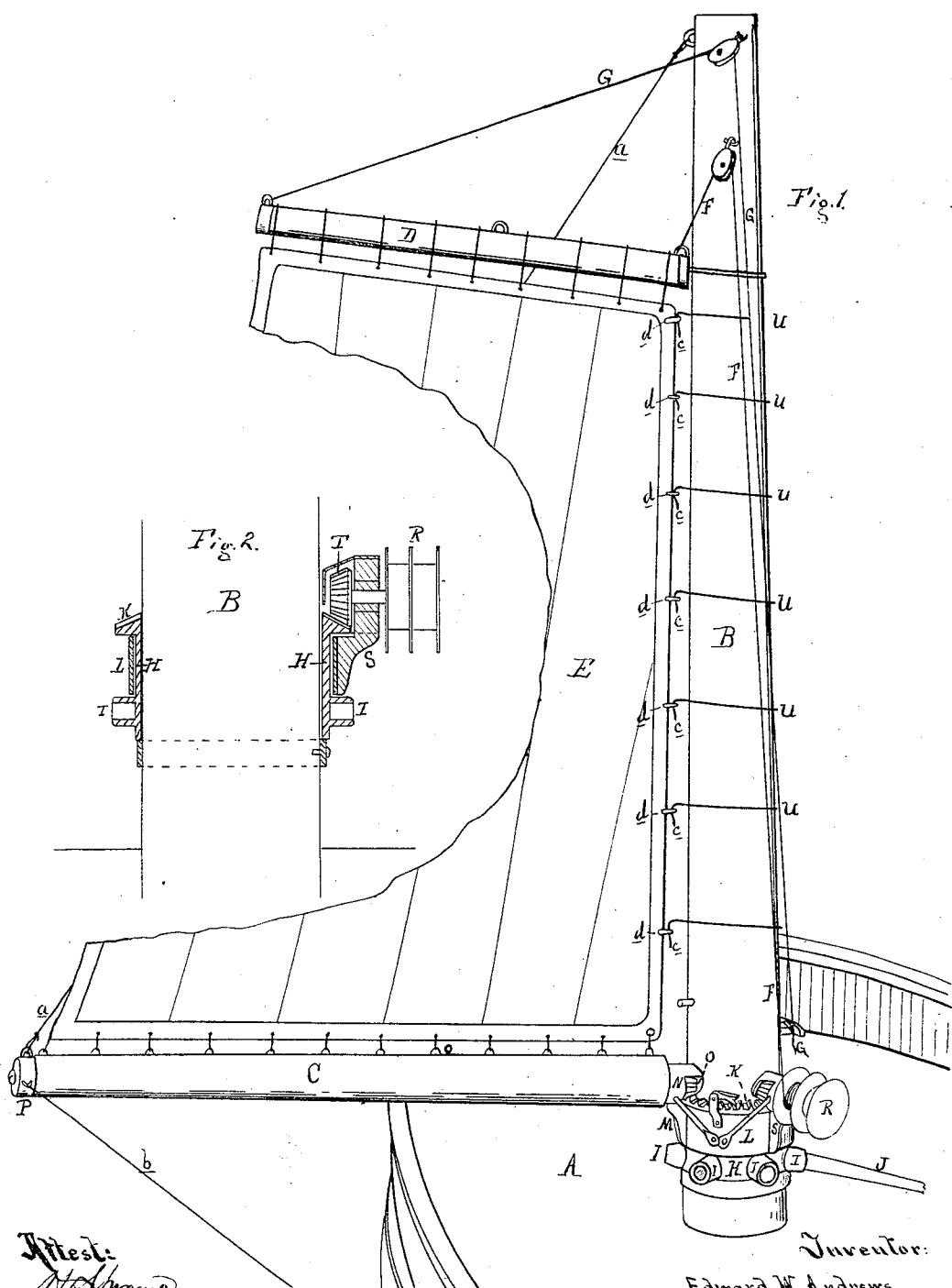
(No Model.)

E. W. ANDREWS.

MECHANISM FOR REEFING SAILS.

No. 282,599.

Patented Aug. 7, 1883.



# UNITED STATES PATENT OFFICE.

EDWARD W. ANDREWS, OF DETROIT, MICHIGAN, ASSIGNOR TO GEO. M. INGALLS, OF SAME PLACE.

## MECHANISM FOR REEFING SAILS.

SPECIFICATION forming part of Letters Patent No. 282,599, dated August 7, 1883.

Application filed October 4, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD W. ANDREWS, of Detroit, in the county of Wayne and State of Michigan, have invented new and useful 5 Improvements in Reefing and Furling Attachments for Sails; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this 10 specification.

The nature of this invention relates to certain new and useful improvements in the construction and operation of devices for reefing and furling sails, whereby the sail may be 15 quickly reefed and furled without the employment of gasket-ropes or reefing-points.

The invention consists in the peculiar construction and arrangement of the boom in relation to the mast, and in the peculiar construction 20 of devices whereby a rotary motion is imparted to said boom, reefing and furling the sail upon the same without changing its elevation, and in the peculiar construction, arrangement, and various combinations of the 25 parts, all as more fully hereinafter set forth.

Figure 1 is an elevation, looking toward the bow, with sail spread. Fig. 2 is a vertical longitudinal section.

In the accompanying drawings, which form 30 a part of this specification, A represents a section of a boat's deck, and B the mast.

C represents the lower boom, and D the gaff boom, to which the sail E is bent in any of the known ways now in common use, and are provided 35 with the throat-halyards F and peak-halyards G, as in the ordinary manner.

H represents a sleeve or collar, which encircles the mast, as shown, and is designed to be made in two or more sections, secured together by proper bolts and flanges, in order 40 that it may be readily removed for the purpose of repairs and adjustment; but as this forms no part of my invention, there being many ways by which the desired result can be obtained, I do not enter into a description of 45 such construction. The lower portion of this sleeve is provided with the radially-projecting studs I, which are recessed to receive the hand-spikes J, by means of which the sleeve or col-

lar is rotated or turned upon the mast. The 50 upper portion of this sleeve H terminates in an outwardly-projecting flange, upon the upper face of which is formed the crown-gear K. A band or collar, L, encircles this sleeve H, between the studs I and the crown-gear K, and is provided with a bracket, M, the upper end of which terminates in a band-ring, N, within which the inner end of the boom C projects and freely rotates, having secured to such inner end a bevel-gear, O, in any proper and 60 convenient manner, which meshes with the crown-gear K. The outer end of the boom C is provided with a collar, P, within which it freely rotates, and to this collar is secured the lower end of the stay a, which supports the 65 other end of the boom, and which also carries the sheet-line b. The inner end of the gaff is secured to the mast by the jaw and grommet in common use, or in any other proper and convenient manner.

R represents a reel or windlass properly journaled in the bracket S, which projects from the band or collar L, the inner end of the shaft of such reel carrying a bevel-gear, T, which 70 engages and meshes with the crown-gear K. 75 To this reel R is secured the lower end of the throat-halyards, for the purposes hereinafter described.

The sail-hoops U, which encircle the mast, are provided with hooks c, which are designed 80 to engage with rings d, rigidly secured to the leech-rope of the sail.

In practice we will suppose that the sail has been spread or hoisted, as shown in the drawings, and that it is desired to take a reef in 85 the same. To accomplish this the peak-halyards are cast loose from the belaying-pin, the hand-spikes are inserted in the studs I of the sleeve H, the latter of which is rotated or turned around the shaft, which, through the connections herein described, causes the boom C to revolve and wind upon it the sail, while at the same time the reel R is likewise rotated, which allows the throat-halyards to ease away proportionately as the sail is reefed upon the 90 boom, a suitable dog being employed at any suitable point to prevent a retrograde movement of the parts. It can readily be seen that 95

by a continued rotation of the boom, as herein described, the sail can be entirely reefed and furled upon the boom from aboard ship, no matter what the position of the sail is, and without the employment of reef-points in reefing the sail. When it is desired to raise the sail, the sleeve H is rotated in an opposite direction to that last above described, which causes the reel R to reel up the throat-halyards as fast as the sail is unfurled from the boom, after which the peak-halyards are hauled taut and made fast to a belaying-pin, as shown in the drawings; or, if preferred, a double reel may be employed, which will reel up both the peak and throat halyards simultaneously. As the sail is raised, a seaman engages the rings d with their respective sail-hoops, while in reefing and furling they automatically disengage themselves, although I do not desire to confine myself to this precise construction and means of operation, as there are various other means which may be employed for the same purpose.

While I have described the operating of the sleeve upon the mast by means of hand-spikes, this will be applicable to the larger sailing craft, while upon the smaller craft a crank and pinion may be advantageously employed without departing from the spirit of my invention.

By this construction and arrangement of parts it can readily be seen that the sail can be quickly and easily reefed or entirely furled without danger to the sailor and with a small force or crew, while it will also be seen that the sleeve can be raised or pushed up the mast, so that the boom may have a free swing over any deck-load that the vessel may be carrying.

What I claim as my invention is—

1. In a reefing attachment for sails, and in combination with the mast of a vessel, a geared sleeve encircling said mast, resting on a suitable stop thereon, and adapted to have a vertical movement above said stop, and intermediate mechanism, substantially as described, between the sleeve and boom to sup-

port and revolve said boom, substantially as set forth.

2. In a reefing attachment for sails, and in combination with the mast of a vessel, a geared sleeve encircling the mast and arranged to engage with the gear upon the inner end of the boom, whereby the said boom is rotated, substantially as and for the purposes described.

3. In a reefing attachment for sails, and in combination with the mast of a vessel, a geared sleeve H, engaging with the gear upon the end of the boom, and the reel R, mounted on a shaft carrying a pinion engaging with the teeth of the geared sleeve, whereby the halyards are reeled upon or off the reel simultaneously with the setting or reefing of the sail, substantially as and for the purposes specified.

4. In combination with the mast B and boom C, the geared sleeve H, carrying the collar L, for supporting the inner end of the boom, which is provided with the bevel-gear O, and the collar P, upon the outer end of the boom, to which latter is secured the stay a, substantially as and for the purposes specified.

5. In combination with a mast, the main boom, to which the lower end of the sail is secured, a windlass constructed to embrace the mast and revolve around it independently of the boom, and devices, substantially as described, for supporting and operating said windlass and boom, as set forth.

6. In a reefing attachment for sails, and in combination with the main boom adapted to be rotated in setting, reefing, or furling the sail, the hoops upon the mast, adapted to automatically disengage from the rings upon the sail as it is reefed or furled; substantially as and for the purposes herein described.

EDWARD W. ANDREWS.

Witnesses:

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