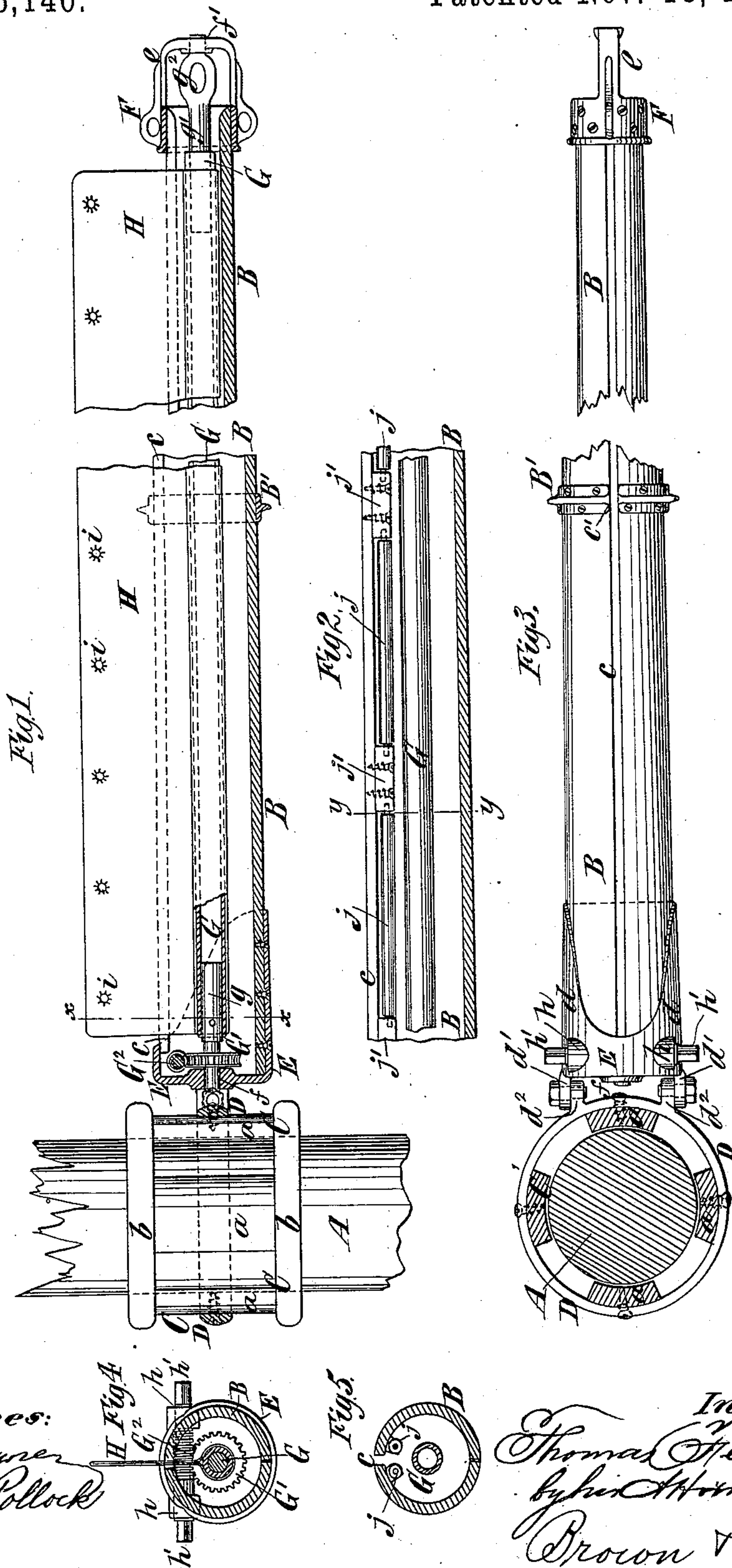


(No Model.)

T. FEARON.  
MEANS FOR REEFING SAILS.

No. 308,146.

Patented Nov. 18, 1884.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

THOMAS FEARON, OF YONKERS, NEW YORK.

## MEANS FOR REEFING SAILS.

SPECIFICATION forming part of Letters Patent No. 308,146, dated November 18, 1884.

Application filed January 11, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS FEARON, of Yonkers, in the county of Westchester and State of New York, have invented a new and  
5 useful Improvement in Means for Reefing Sails, of which the following is a specification.

My invention relates to means which are employed for reefing sails by rolling them up.

The invention consists in the combination,  
10 with a hollow non-rotary boom having a longitudinal slot or opening in its top for the passage of a sail to and from its interior, of a rotary shaft journaled within the boom, and to which the sail is to be connected, and guide-  
15 rollers arranged at opposite sides of said opening or slot, to guide the sail in its passage to and from the interior of the boom.

The invention also consists in other combination of parts and details of construction,  
20 hereinafter described, and set forth in the claims.

In the accompanying drawings, Figure 1 is a longitudinal section of the end portions of a boom embodying my invention and an elevation of a portion of the mast with which the boom is connected. Fig. 2 is a similar section of a portion of the boom, showing the position of the guide-rollers and the means employed to secure them to the boom. Fig. 3 is a trans-  
30 verse section of the mast and a plan of the end portions of the boom. Fig. 4 is a transverse section of the boom on the plane of the dotted line *x x*, Fig. 1, looking toward the mast; and Fig. 5 is a transverse section of the boom on the dotted line *y y*, Fig. 2.

Similar letters of reference designate corresponding parts in all the figures.

A designates the mast, and B the boom. As here shown, the mast is fitted with a sleeve, C, which is adapted to slide up and down thereon, and which is surrounded by the band D, to which the boom is connected. This sleeve is or may be formed of a number of upright strips or staves, *a*, surrounded and held in place by bands *b* of wood or metal, and the  
45 band D is secured to the staves or strips *a* by screws or otherwise. The boom B is hollow from end to end, and may be formed of two or more longitudinal pieces worked out to the proper curvature in their transverse section, and secured together by bands B', encircling the boom and secured thereto by screws or

other means. The boom may be made of metal, if desired. The boom is slotted through the entire or nearly the entire length at *c*, and in the bands B' are openings *c'*, coincident with the slot or opening *c*. Only one band B' is here shown, but they encircle the boom at intervals of two or three feet in its length, and as many are employed as are needed to give the boom the necessary strength. At the mast end the boom is provided with a cap-piece or cap, E, the flange or cheeks *d* of which are extended along the boom at the bottom and sides to give the boom the necessary support, and are cut away or removed at the top, as shown in Fig. 3, so as not to cover the slot *c*. The cap E is secured to the boom by screws or other means, and is provided with lugs or ears *d'*, which are pivotally secured to lugs *d''* on the band D, as best shown in Fig. 3. At the outer end the boom is provided with a cap or collar, F, having a yoke, *e*, extending beyond and forming a part of the cap.

G designates a shaft extending lengthwise of the boom at the center thereof, and supported in bearings *f f'* in the caps E F. This shaft may be solid, or it may be formed by a pipe having studs or gudgeons *g g'* driven into its ends, as here shown, the gudgeons *g'* at the outer end of the boom being formed with an eye, *g''*, for a purpose hereinafter described. The shaft G is capable of rotating in its bearings *g g'*, and may be turned by any suitable means. The devices here shown for turning the shaft consist of a worm-wheel, G', secured upon its inner end, and a worm or screw, G<sup>2</sup>, engaging with said wheel and supported in bearings *h* in the cap E. The worm or screw G<sup>2</sup> may be turned by a wrench or key applied to either of its projecting ends *h'*. The slot or longitudinal opening *c* is for the passage of a sail to and from the interior of the boom, and the lower edge of the sail may be laced or otherwise secured directly to the shaft G or to a lacing strip or piece, H, of sail-cloth or other fabric, which surrounds the shaft and is of a width sufficient to extend through and beyond the slot *c* when not rolled upon the shaft. This strip H is provided with eyelet-holes *i*.

In order to prevent the sail from chafing or rubbing at the sides of the slot *c*, I arrange guide-rollers *j* on opposite sides of the slot, as shown in Figs. 2 and 5, and in its passage



through the slot the sail bears on one or the other of these rollers, which turns freely by the frictional contact of the sail with it. The rollers  $j$  are pivoted in bearings  $j'$ , which consist of blocks secured to the interior of the boom on opposite sides of the slot  $c$  by screws or other means. The lower edge of the sail is laced to the strip  $H$ , as above described, and the leech-rope, which extends along the outer edge of the sail, is passed through the outer end of the slot  $c$  and tied in the eye  $g^2$  of the shaft  $G$ .

To reef the sail it is only necessary to turn the shaft  $G$ , and the sail will thereby be drawn in through the slot  $c$ , and it and the leech-rope will be rolled upon the shaft within the boom. The leech-rope will be rolled or wound upon the shaft  $G$  with the sail, and being tied to the eye  $g^2$  will keep the sail extended along the shaft and cause it to roll smoothly on the shaft.

I am aware that it is not new to reef a sail by rolling it up, and booms and spars have been variously constructed to provide for so reefing sails. A rotary shaft has been arranged lengthwise of and upon the exterior of a boom, and the sail reefed by rolling it upon the shaft. The solid boom itself has been so supported that it could be rotated to wind or roll the sail upon its exterior, and a solid non-rotary boom has been surrounded by a tube capable of rotation to roll the sail upon its exterior.

I am also aware that for reefing square sails a rotary shaft has been arranged within a hollow spar, so that by turning said shaft the sail could be rolled thereon within the spar. In some cases the said internal rotary shaft has been provided beyond the ends of the hollow spar with windlasses, and these have been turned to rotate the shaft by two chains or ropes extending to the deck of the vessel. In another case the ends of the rotary shaft, which project beyond the ends of the hollow spar,

have been provided with spur-wheels, which were geared with pinions on opposite ends of an external rotary shaft, arranged lengthwise of and supported upon the hollow spar, and having power applied to it by a chain-wheel and chains extending over sheaves and downward to the deck of the vessel. I do not claim any of the constructions and combinations above described as of my invention; but

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

1. The combination, with a hollow non-rotary boom having a longitudinal slot or opening in its top for the passage of a sail to and from its interior, of a rotary shaft journaled within the boom, and to which the sail is to be connected, and guide-rollers arranged at opposite sides of said slot or opening, and serving to guide the sail to and from the interior of the boom, substantially as and for the purpose herein described.

2. The combination, with a hollow non-rotary boom,  $B$ , having in its top the slot or opening  $c$ , of the cap  $E$ , applied to the inner end of the boom, and provided with lugs or ears  $d'$ , the band  $D$ , provided with lugs or ears  $d^2$ , the shaft  $G$ , arranged within the boom and having a bearing in said cap, and gearing applied to one end of said shaft for turning it, substantially as herein described.

3. The combination, with the hollow non-rotary boom  $B$ , having the slot or opening  $c$  in its top, of the caps  $E$   $F$ , applied to the ends of the boom, the shaft  $G$ , journaled in said caps, and provided at its outer end with the eye  $g^2$ , the worm-wheel  $G'$ , and the worm or screw  $G^2$ , journaled in the cap  $E$ , all substantially as herein described.

THOMAS FEARON.

Witnesses:

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