G. A. Bigelow.

Sails & Rigging.

No. 52,517. Patented Feb. 13, 1866

Fig: 2.

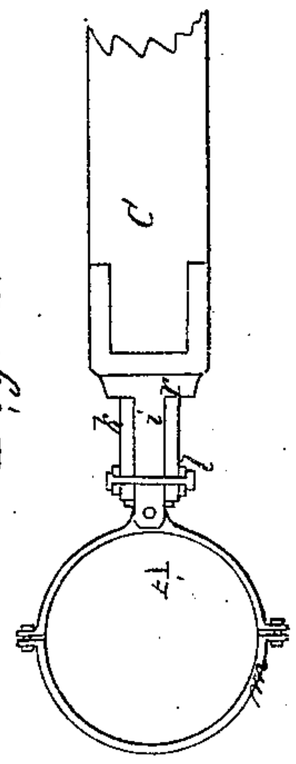


Fig: 3.

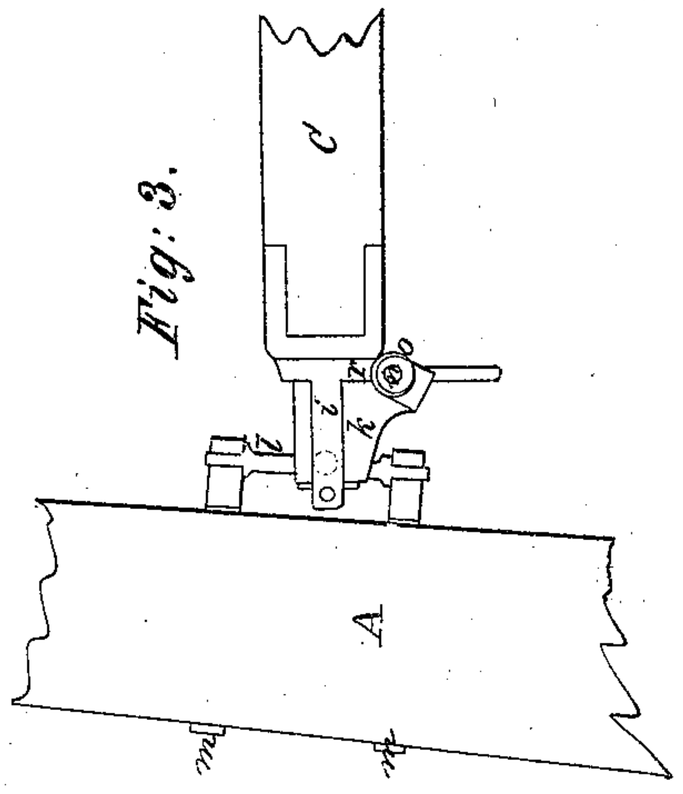


Fig: 4.

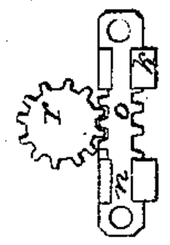
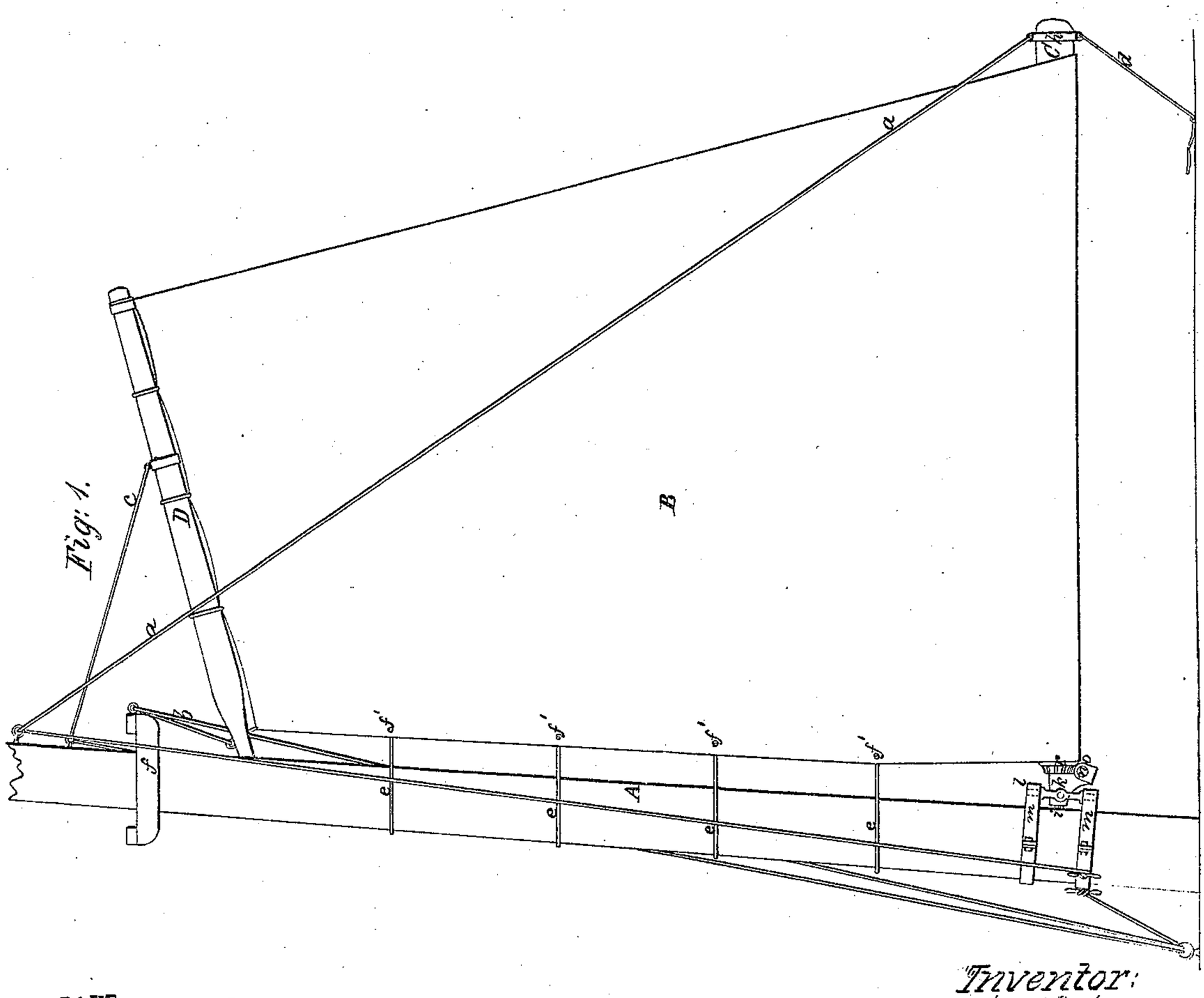


Fig: 1.



Witnesses:
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Fred. Curtis

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by his attorney.
R. H. Eddy

UNITED STATES PATENT OFFICE.

GEORGE A. BIGELOW, OF NEW BRAINTREE, MASSACHUSETTS.

IMPROVED APPARATUS FOR REEFING FORE-AND-AFT SAILS.

Specification forming part of Letters Patent No. **52,517**, dated February 13, 1866.

To all whom it may concern:

Be it known that I, GEORGE A. BIGELOW, of New Braintree, in the county of Norfolk and State of Massachusetts, have made a new and useful invention for Reefing Fore-and-A. Sails; and I 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 a mainsail as provided with my invention. Fig. 2 is a horizontal section of the rolling boom and the contrivances for connecting it to the masts. Fig. 3 is a vertical section of such boom and such contrivances. Fig. 4 is a transverse section, taken through the worm-shaft, to be hereinafter described.

In the said drawings, A denotes the mast; B, the sail; C, the boom, and D the gaff of the sail. *a* is the topping-lift; *b*, the throat-halyards; *c*, the peak-halyards; *d d*, the sheets, and *f* the cross-ties.

A series of mast-hoops, each being formed, as shown in Fig. 5, with a hook, *f'*, to enter an eye in the sail, is represented at *e e e* as applied to the mast. The sail at its lower edge is connected to the boom, which at its outer end is supported by and so to be revolved within a ring, *h*, which has the sheets *d d* and the topping-lift connected to it.

The inner end of the boom is provided with a journal, *i*, which is supported in a box or bearing, *k*, connected to the mast by a universal joint or gimbals, as shown at *l*, the said gimbals being supported by two hoops, *m m*, encompassing and fixed to the mast.

The box *k* carries a worm-shaft, *n*, provided with an endless screw or worm, *o*, which engages with a worm-gear, *r*, fixed on the end of the boom. By revolving the shaft in one direction by a crank applied to it the boom will be revolved so as to wind the sail on it. During a reverse motion of the crank the sail will be unwound from the boom. In this way the sail may be reefed or unreefed more or less, as circumstances may require. The gimbals admit of the boom being swung in any direction, either upward, downward, or laterally.

While the sail may be in the act of being reefed each of the mast-hoops, as it may reach the immediate vicinity of the boom, should be unhooked from the sail in order that it may not obstruct the winding of the sail on the boom. In this way, when desirable, the whole sail may be furled on the boom.

From the above it will be seen that the boom is supported not only by the ring *h* and its sustaining-ropes, but by the journal *i* and box *k*, and that such boom is revolved by means of the worm-shaft *n*, its worm *o*, and worm-gear *r*.

I claim—

1. The combination of the rotary boom C, the detachable mast-hoops *e*, and the means of supporting and revolving the boom.

2. The combination of the same and the gimbals *l*, or their equivalents, applied to the boom and mast, the whole constituting an apparatus for either reefing or furling a fore-and-aft sail, substantially in manner as specified.

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Witnesses:

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