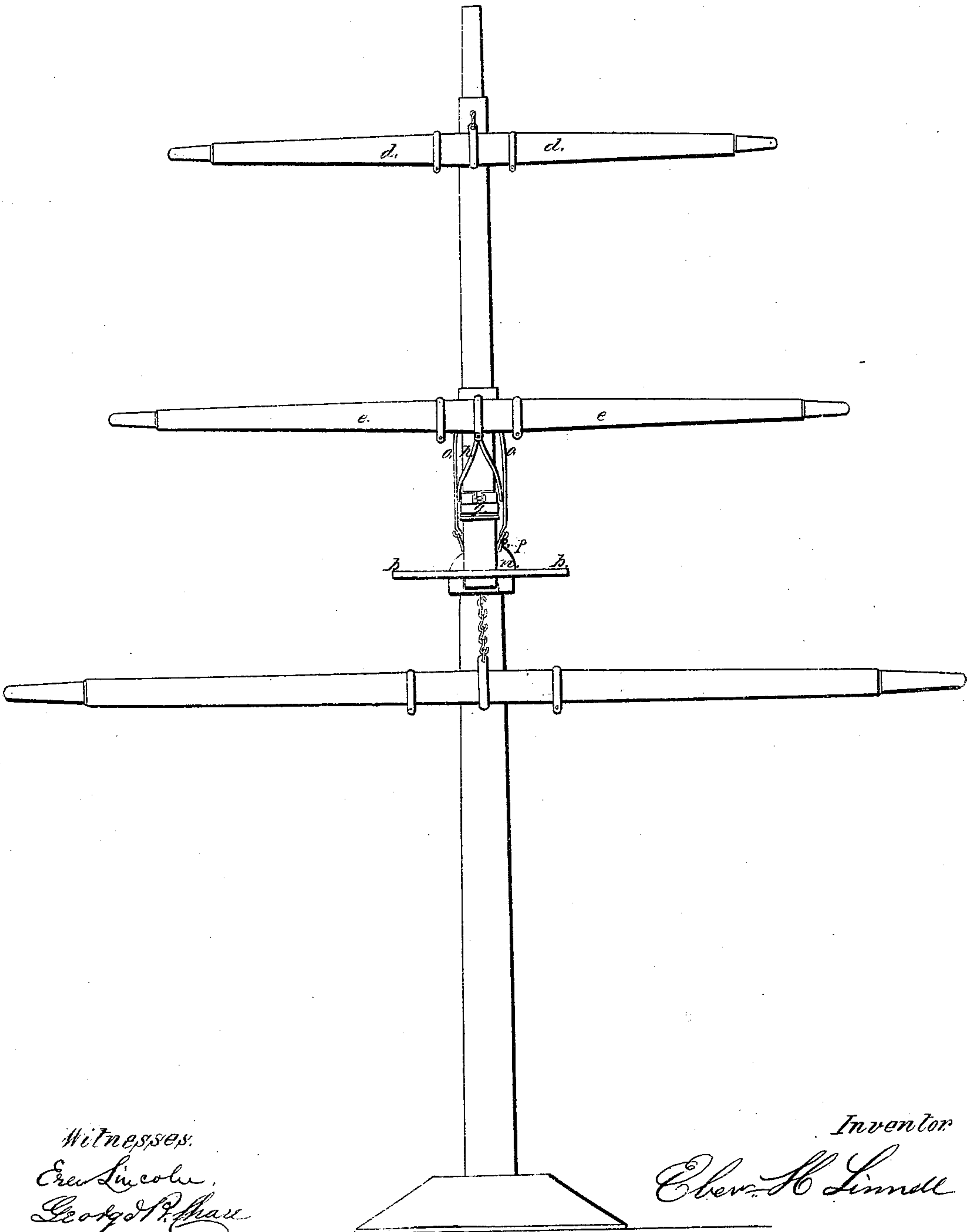


E. H. Linnell,
Masts & Snars.

N^o 16,650.

Patented Feb. 17, 1857.

Fig. 1.



Witnesses:
E. Lincoln,
George A. Shaw

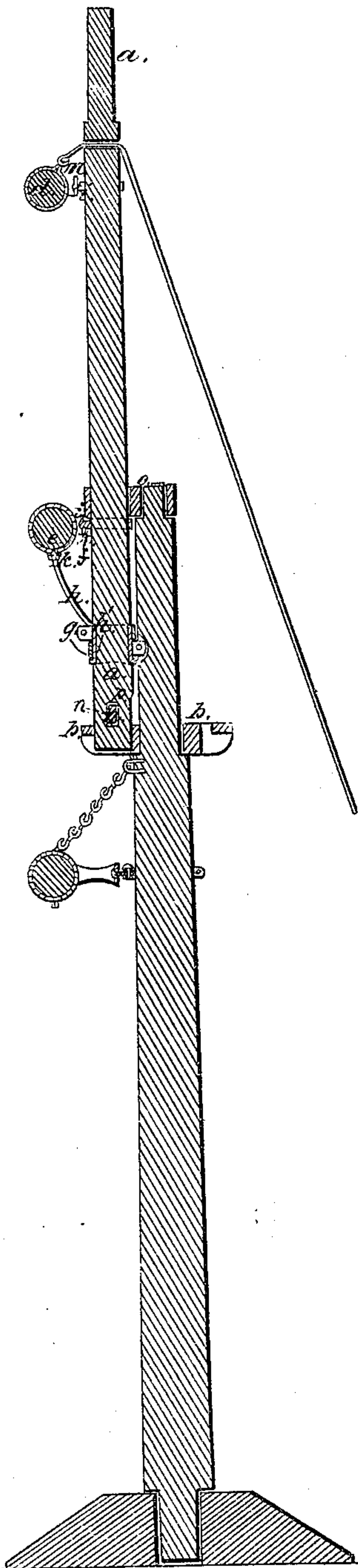
Inventor
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N^o 16,650.

Patented Feb. 17, 1857

Fig. 2.



Witnesses:
Erwin Lincoln
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UNITED STATES PATENT OFFICE.

EBER H. LINNELL, OF ORLEANS, MASSACHUSETTS.

ATTACHING EXTRA TOPSAIL-YARDS TO VESSELS.

Specification of Letters Patent No. 16,650, dated February 17, 1857.

To all whom it may concern:

Be it known that I, E. H. LINNELL, of Orleans, in the county of Barnstable and State of Massachusetts, have invented certain new and useful Improvements in Rigs for Vessels, and that the following description, taken in connection with the accompanying drawings, hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements by which my invention may be distinguished from others of a similar class, together with such parts as I claim and desire to have secured to me by Letters Patent.

The figures of the accompanying plate of drawings represent my improvements.

Figure 1 is a front elevation of a mast, &c., with my improvements applied thereto. Fig. 2 is a central vertical section of the same.

The present invention consists in a new mode of attaching and applying extra top-sail yards in square rigged vessels. Extra top sail yards have been sometime in use, and have heretofore been supported by a chain, and by more recent improvements, some of which are now very generally applied, by a swivel joint in a ring attached to the cap, with a vertical arm resting on the trestletree. Among the disadvantages of suspending the yard from the cap in this way are the following:—The whole strain comes upon the cap, which ordinarily, without this addition, sustains all the strain it ought to bear, while the yard itself, in order to be attached snugly to the cap, has to be made smaller than is consistent with strength, so that in a gale of wind the yard is often broken. The head rope also of the lower top-sail, swings round unequally with the foot rope of the same, as the extra top-sail yard being attached to the cap, swings from a center that is in a different plane from the lower yard, thereby twisting and wrinkling the sail and straining the clews. Again by this mode of attachment to the cap, the yard cannot be braced up sharp because it interferes with and chafes the top-mast rigging. By my improvements all these objections are entirely obviated the lower top-sail yard being suspended and swinging from the top-mast as a center, thereby bringing all the yards in the same diagonal plane and preventing the sail from wrink-

ling, as the head rope of the top-sail swings around equally with the foot rope of the same. By attaching the yard to the top-mast itself, the cap is relieved from all strain, and the yard instead of being made smaller as is necessarily the case when attached to the cap, can be made of any desired size and strength. By my mode of attachment also the yard can be braced up sharper than by other rigs, as when so braced, it hangs entirely clear of the top-mast rigging and cannot chafe the same. The advantage of having the yards all in the same plane, so that the sails will all draw smooth and free from wrinkles will readily be manifest.

a a in the drawings represent the top-mast, *b b* in the trestletree and *c* the cap.

d d is the upper top-sail yard and *e e* the lower top-sail yard. This yard *e e* is attached to the top-mast *a a* by collars *f* and *g* the upper collar *f* being attached to the yard and the lower one to the diagonal forked brace *h* which sustains the yard in position. Both the collars *f* and *g* encircle and turn on the top-mast, the lower one *g* turning upon an annular plate or bearing *h'* set into the periphery of the top-mast a little. The yard *e e* is attached to the upper collar *f* by a swivel joint *i* and to the forked brace *h* by a similar joint *k*. The upper yard *d d* is attached to the top-mast by a collar *l* and swivel joint *m*.

From the foregoing description it will be seen that the yard swings from the top-mast as a center and that the yard is supported entirely by the top-mast thereby relieving the cap of all strain, and preventing the head of the mast from being twisted. By this mode of attachment as the yard stands out from the top-mast, instead of being drawn in close to the same, as is necessarily the case when suspended from the cap, sufficient room is afforded for the yards to be braced sharp up without interfering with the top-mast rigging, and this mode of attachment also causes the lower top-rails when the upper yard is hoisted to hang in the same plane from the upper top-rail yard or the foot of the top-rail.

In order to relieve the strain upon the fid *n*, occasioned by the additional weight of the extra yard and its attachments, diagonal braces *o, o*, one on each side are attached to the mast head, and fastened to a

band *p* passing through the foot of the top-mast, thereby partially sustaining the top-mast, and relieving its weight upon the fid.

The forked brace *h* performs an essential service in securing the easy management of the yard, as the two forks of the brace attached to the turning collar balance the yard, while the collar permits the free play of the yard and brace.

Having thus described my improvements I shall state my claim as follows:

I do not claim the use of an extra top-rail yard, nor the holding it stationary, *i. e.*, so as not to be raised or lowered, as both the use of an extra top-rail yard, and so holding it have long been known, and practised, but

What I do claim as my invention and de-

sire to have secured to me by Letters Patent is—

Attaching and hanging the extra top-sail yard to the top mast itself, by means of the combination of the collars *f* and *g* turning on the top mast, the forked brace *h* connecting said collars and the stationary 25 annular plate *n'* on which the lower collar *g* rests and turns, as herein above described, so that said extra toprail and yard shall swing from the axis of the top-mast as a center, and secure the advantages herein 30 above specified.

EBER H. LINNELL.

Witnesses:

EZRA LINCOLN,
GEORGE R. CHASE.