

C. H. Crandall,
Sails & Rigging.
No. 94,400. Patented Aug. 31, 1869.

Fig. 1.

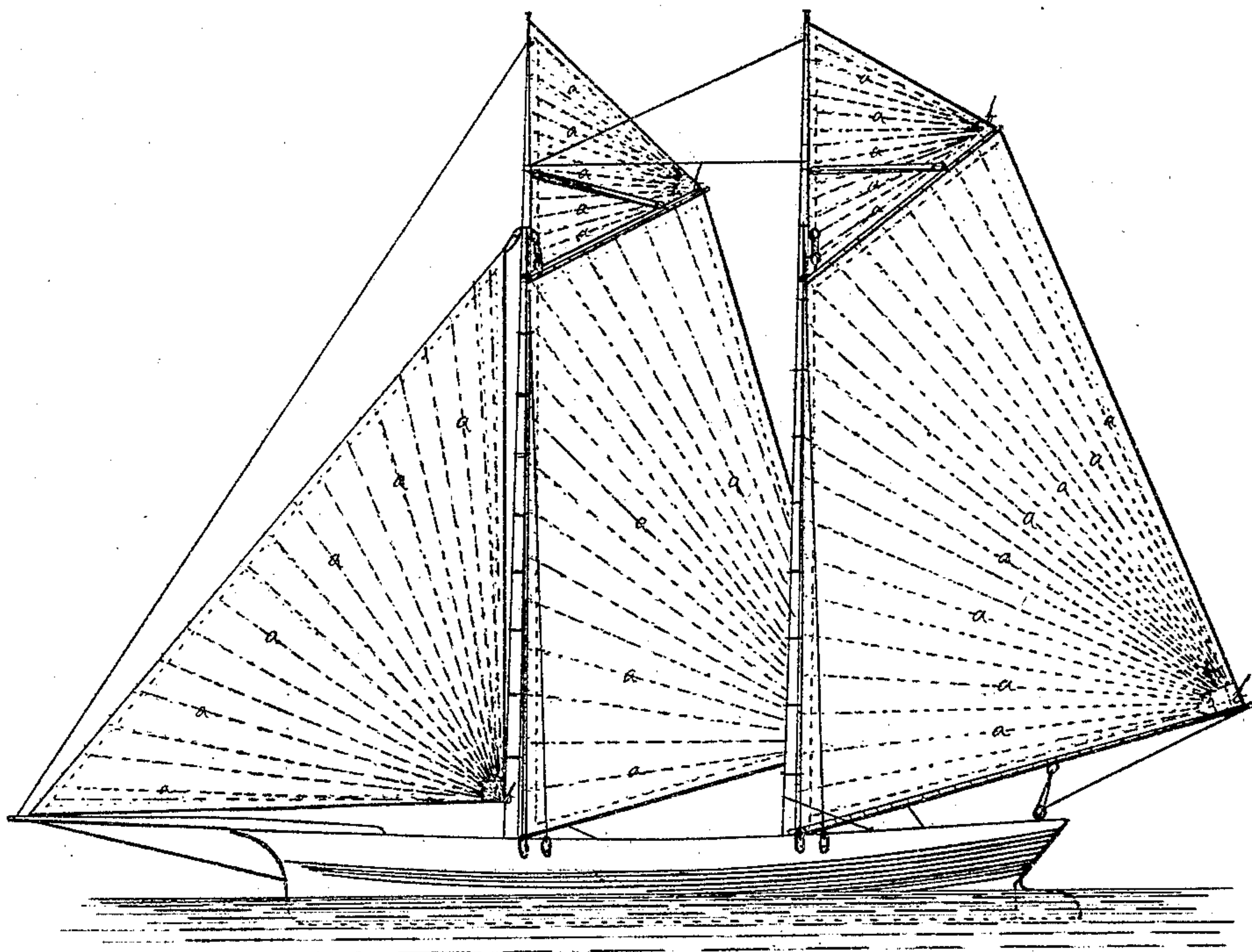
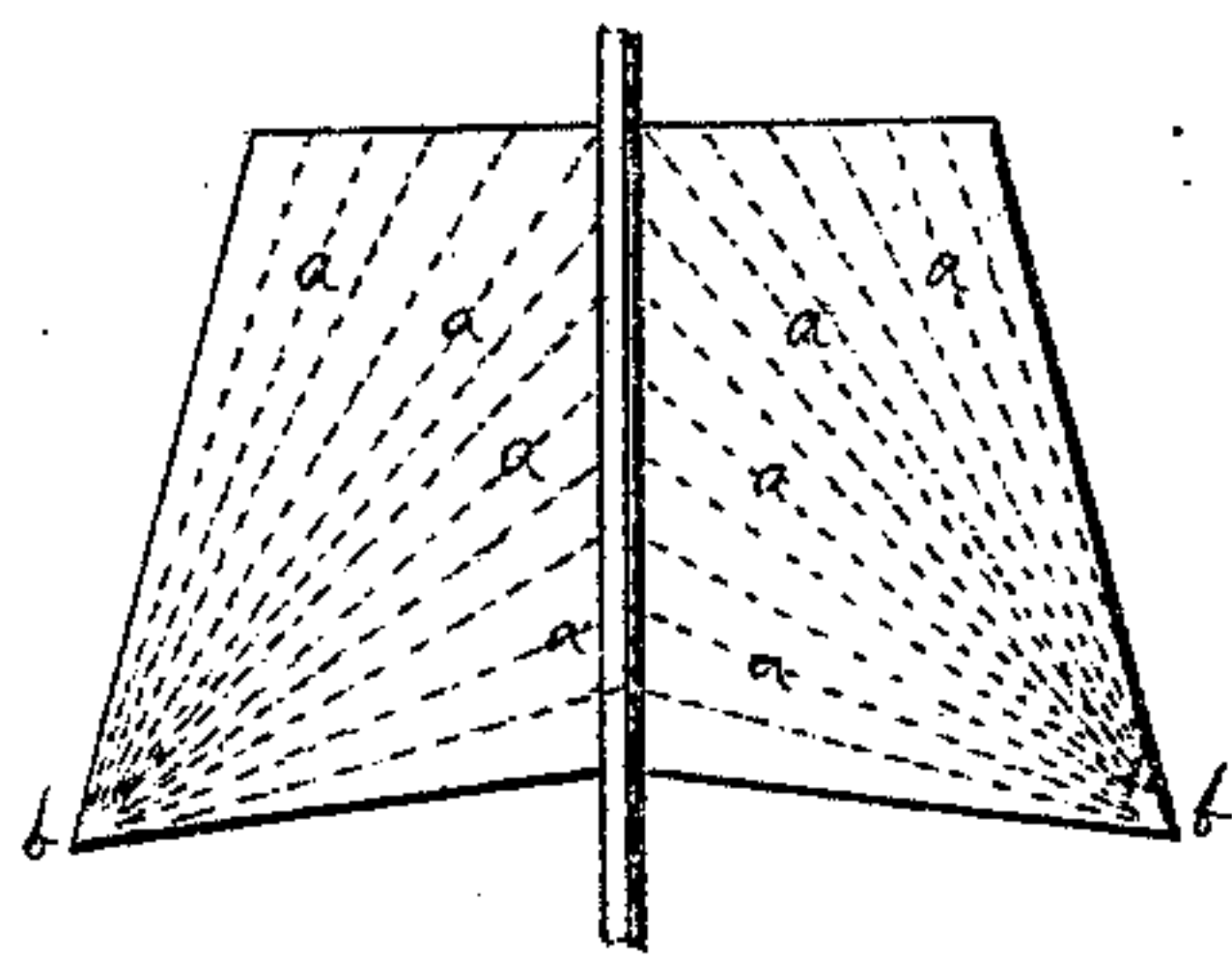


Fig. 2.



Witnesses.
Edw. J. Mott
Jesse Zipp

Inventor.
C. H. Crandall,
by Prindle and Tyer
Attys

United States Patent Office.

CHARLES H. CRANDALL, OF STONINGTON, CONNECTICUT.

Letters Patent No. 94,400, dated August 31, 1869.

IMPROVEMENT IN SAILS FOR VESSELS.

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

To all whom it may concern :

Be it known that I, CHARLES H. CRANDALL, of Stonington, in the county of New London, and in the State of Connecticut, have invented a new and useful Improvement in the Construction of Sails; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which—

Figure 1 represents a schooner, to which sails of my improved construction are applied, and

Figure 2 shows a square-sail of like construction.

In sails, as ordinarily constructed, much difficulty is experienced in securing sufficient strength at the point or points where the greatest strain occurs, to obviate which is the principal object of my invention, which consists in so constructing the sails as that the seams thereof shall all radiate from the clews, by which means all of said seams bear an equal strain, the set of the sail is improved, and it offers less direct resistance to the wind.

In the annexed drawing—

Figure 1 represents a schooner-rigged vessel, having the usual complement of sails, which are secured thereto in the ordinary manner.

It will be seen, that while the front edge of each sail is so secured as to distribute the strain, caused by the force of the wind, equally along its entire length, the rear side or corner of said sail is secured at but one point, (the clew,) which is required to resist a strain many times greater than that thrown upon any other portion of said sail.

As ordinarily constructed, the seams of the sail extend either horizontally or vertically, in parallel lines, by which construction said sail has no greater strength at the clew than at any other part thereof, although required to resist a large proportion of the force of the wind exerted thereon.

In order to so proportion the strength of said sail as to give the greatest amount at the point or points where it is most needed, I construct it so that the

seams *a a* radiate from said point *b*, by which means the cloth forming each strip or section *c*, is placed with its warp in a direct line with the strain, in which position it is enabled to withstand a much greater force than would otherwise be the case.

The seams, also, add much to the strength of the sail, when placed in this manner, being enabled to resist a much greater lengthwise than lateral strain.

When thus constructed, it will be readily seen that from "peak" to "tack" the seams converge to the clew, in precisely the same manner as does the strain, and that each portion of said sail is thus made to bear an equal proportion of the force of the wind.

As seen in fig. 2, in a square-sail constructed by my method, the seams radiate from the lower outer corners, and meet at the centre. This not only gives increased strength to the clews, but also strengthens the "belly" or centre of said sail, and enables it, at that point, to withstand the pressure which frequently tears it asunder vertically.

Another advantage obtained by this construction is, that as the seams tend from the mast into the clew, they run more nearly parallel with the wind, and consequently offer less resistance than when placed vertically, by which means the speed of the vessel is proportionably increased. The speed is also increased by the better set of the sails, which effect is produced by causing each seam to bear an equal strain.

Having thus fully set forth the nature and merits of my invention,

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

Constructing sails so that the seams shall radiate from the clews, substantially as and for the purpose specified.

In testimony that I claim the foregoing, I have hereunto set my hand, this 24th day of July, 1869.

CHAS. H. CRANDALL.

Witnesses:

HENRY S. HANCOX,
ABNER N. STERRY.