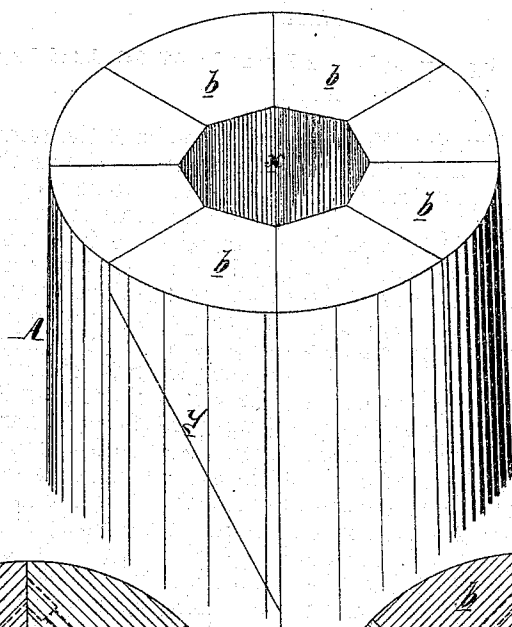
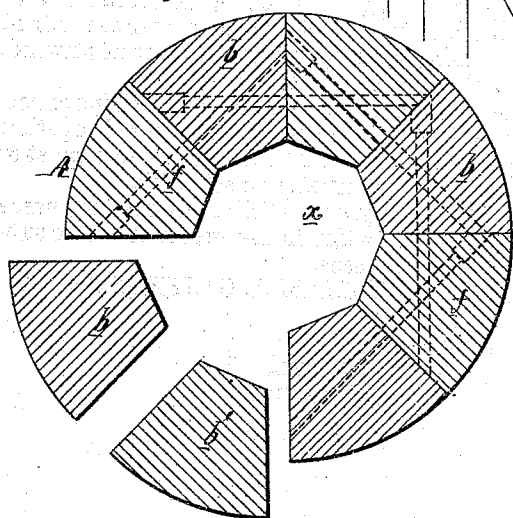


WILLIAM T. GRIFFENBERG.  
Improvement in Masts and Spars for Vessels.  
No. 127,047. Patented May 21, 1872.

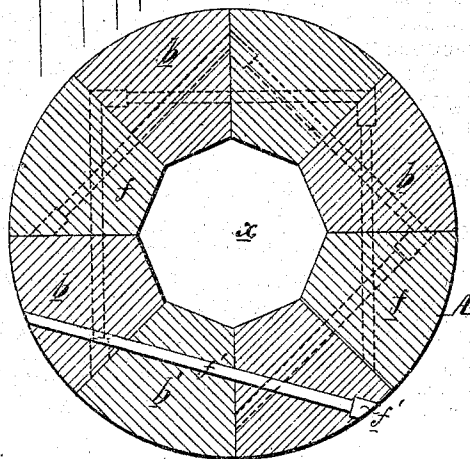
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



Witnesses, *Jno. B. Harding*  
*Thos. McQuinn*

*Wm. T. Griffenberg*  
by his attor.  
*Horsman and Son*

# UNITED STATES PATENT OFFICE.

WILLIAM T. GRIFFENBERG, OF WILMINGTON, DELAWARE.

## IMPROVEMENT IN MASTS AND SPARS FOR VESSELS.

Specification forming part of Letters Patent No. 127,047, dated May 21, 1872.

Specification describing a Tubular Wooden Mast or Spar, invented by WILLIAM THATCHER GRIFFENBERG, of Wilmington, county of New Castle, State of Delaware.

My invention consists of a tubular wooden mast or spar, composed of a number of longitudinal sections fitted together, as fully described hereafter, so that the mast or spar may have a smooth outer surface, unbroken by external fastenings or devices.

In the drawing, Figure 1 is a perspective view of part of a tubular mast or spar, constructed in accordance with my invention; Figs. 2 and 3, transverse sections, showing one method of fitting and securing the sections together.

In the drawing, A represents a portion of the tubular mast, and *b b b*, &c., the longitudinal sections of which it is composed, there being, in the present instance, eight sections, having inclined edges, as shown, so that the whole may be accurately fitted together to form an octagonal tubular mast. It is not necessary that the sections should each be as long as the mast. They can be spliced at any desired point or points, as indicated by the line *y*, in Fig. 1, but care should be taken, in order not to weaken the mast, that the splices in the several sections are not made at points opposite each other. I propose, in constructing the mast, to make the several sections of equal thickness throughout, from the exterior toward the center. The space *x* within the mast will,

therefore, be of the same taper as the exterior of the latter. The sections may be bolted together in various ways. I propose, however, to secure them from the inside by means of bolts, so as to form a firmly-united structure of the whole, and this may be done as follows: Each section *b*, as it is fitted into its place, is secured to the adjoining section by a bolt, *f*, as best observed in Fig. 2, and the fastening is completed by securing the last section *b'* to the sections adjoining it upon both sides by a longer bolt, *f'*, passed through the three sections from the outside of the mast, as seen in Fig. 3. The sections are thus secured as they are fitted together at regular intervals throughout the length of the mast; and, in order to gain additional strength, the bolts may, if desired, be made longer than those shown, and be inclined vertically, some upward, and others downward.

I claim as my invention—

A series of longitudinal wooden strips or sections, fitted to each other, and secured together by bolts, so as to form a tubular wooden mast or spar, all substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM T. GRIFFENBERG.

Witnesses:

WM. A. STEEL,  
JNO. B. HARDING.