

(No Model.)

J. W. MANSFIELD.
HOLLOW MAST.

No. 377,490.

Patented Feb. 7, 1888.

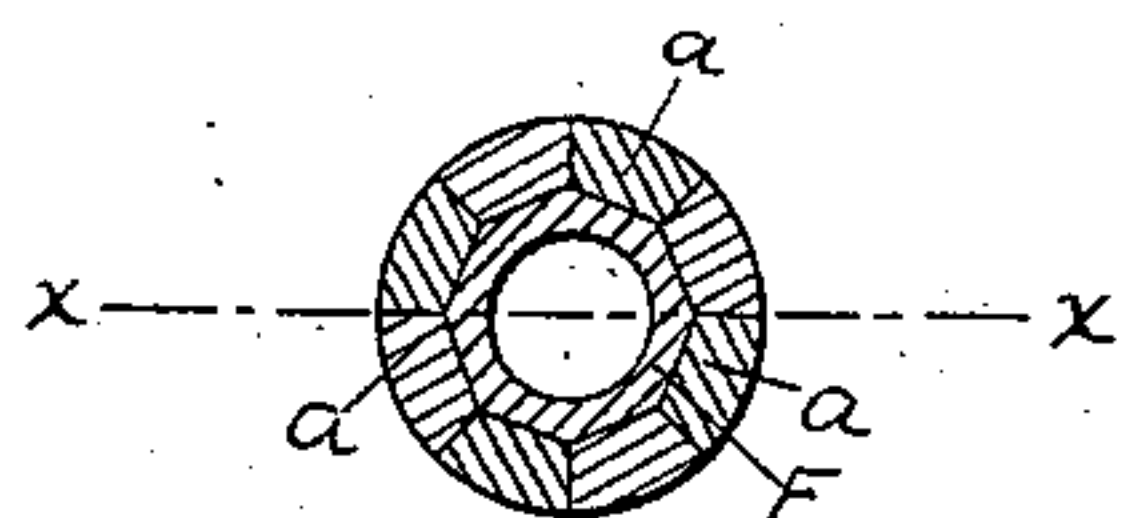


FIG. 4.

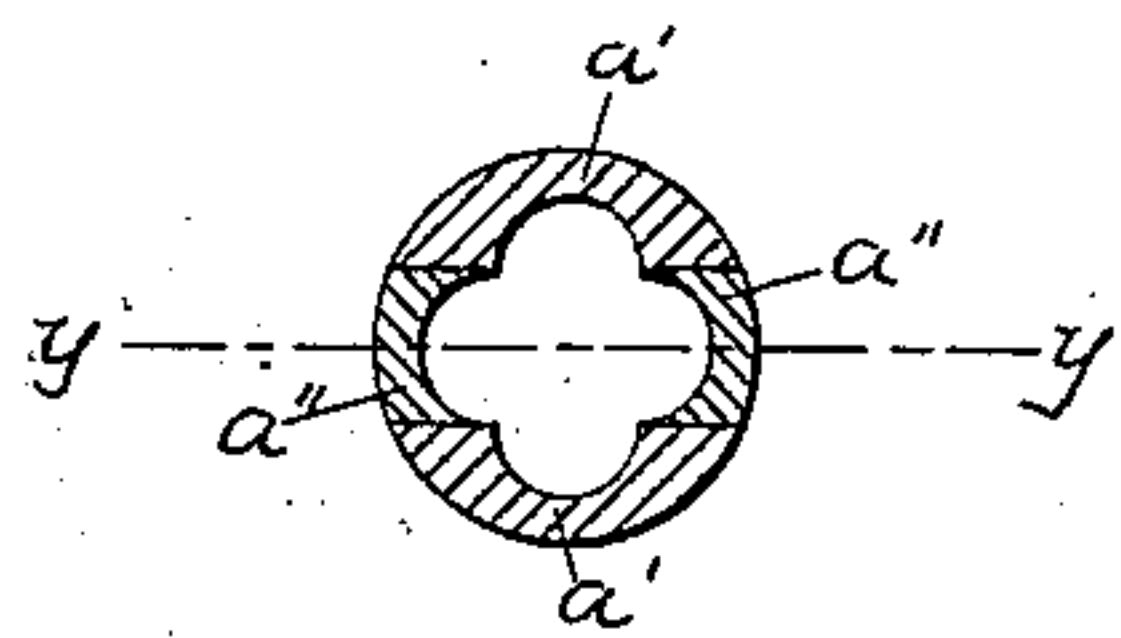


FIG. 2.

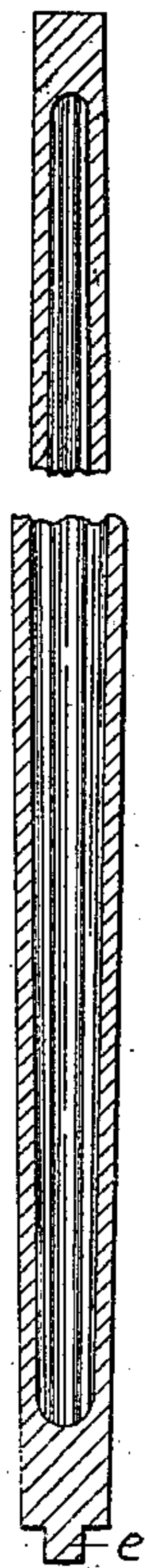


FIG. 1.

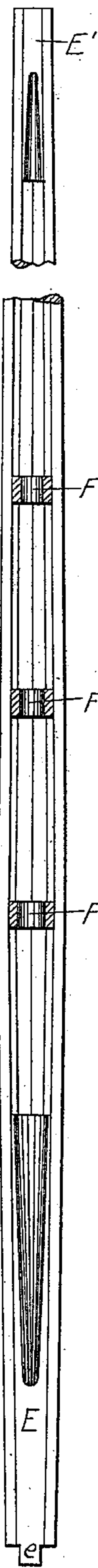


FIG. 3.

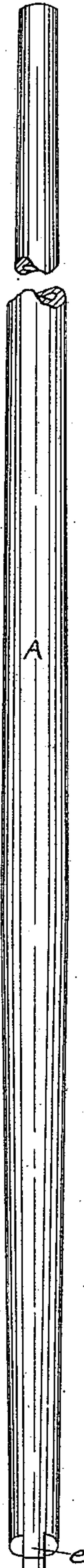


FIG. 5.

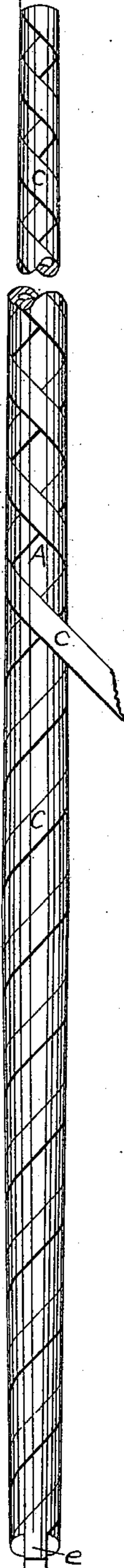


FIG. 6.



FIG. 7.

WITNESSES
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UNITED STATES PATENT OFFICE.

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HOLLOW MAST.

SPECIFICATION forming part of Letters Patent No. 377,490, dated February 7, 1888.

Application filed November 21, 1887. Serial No. 255,677. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. MANSFIELD, of the city of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Hollow Masts; and I do hereby declare that the following is a full, clear, and exact description of the same.

Referring to the accompanying drawings, Figure 1 shows in longitudinal section one form of the shell of my improved mast, the section being taken on *y y*, Fig. 2. Fig. 2 is a transverse section of the same. Figs. 3 and 4 are respectively longitudinal and transverse sections of another form of shell, Fig. 3 being a section on *x x*, Fig. 4. Fig. 5 shows in elevation the shell of the mast ready for winding. Fig. 6 shows the method of coating the shell with cloth. Fig. 7 represents the mast with its outer coating of paper.

My invention consists of an improved hollow mast or spar, the details of which are hereinafter set forth.

My object has been to produce a mast of much lighter weight than those commonly in use. Heretofore hollow masts have been impracticable on account of their weakness; but by the simple process of coating the shell with cloth and paper in the manner described in my former patent, hereinafter referred to, a hollow mast is formed much lighter than the ordinary solid mast, and at the same time quite as strong. Lightness of masts or spars is a great desideratum in yachts, especially in those used for racing purposes.

I preferably make the shell of the mast in three or more strips or sections cut to the requisite length, given the proper shape, and when put together covered, as set forth in my process patent herein referred to.

Figs. 1, 2, 3, and 4 show two forms of shell. As shown in Figs. 3 and 4, the shell is made up of eight strips, each of which is rounded on the outside, and on the inside may be either flat, as here shown, so as to form an octagon on the inside when the pieces are put together, or may be gouged out to make a circle on the inside. These sections are glued or otherwise secured together around internal supporting-rings, *F*, placed at intervals along the interior of the shell. At the bottom is the core *E*, having at its lower end the step *e*. This step-core

E, as well as the top or closing core, *E'*, is made, preferably, in two half-sections, so as to be gouged out on the inside, as represented in Fig. 3. Any number of sections *a* may be employed to make up the shell—as two, four, or six, and the strips may be tongued together, if desired. In Figs. 1 and 2 is shown an excellent form of shell made in four pieces, *a' a' a'' a''*, the strips being gouged out on the inside to form a corrugated interior. The portions of the strips or sections thus gouged out are those portions between the joints, and I thus secure wide bearing-surfaces for gluing the strips together, and have at the same time a much lighter and stronger mast, by reason of the gouging out of the superfluous wood between the joints, than if the interior were of circular section. In this case no braces are necessary, and the step *e* may be formed on the shell itself instead of on a core, as in the first case. If the mast is made in two pieces or sections, they are gouged out to the required thickness of shell, and when put together the transverse section is preferably a circle both inside and outside.

A United States patent was granted to me October 11, 1887, No. 371,204, for a process of manufacturing hollow masts, and reference is hereby made to said patent.

The strength may also be considerably increased by covering the joints on the inside of the shell with suitable material. One way of doing this is by gluing together half the sections at a time, so as to form but two pieces, and then, previous to the final gluing together to form the complete shell, covering the joints on the inside with strips of cloth and then of paper, using the same preparation of glue and white lead as described in my above-mentioned process patent. All but two of the joints may thus be easily covered in a mast closed at its ends. In masts closed by a core all the joints can be easily covered.

Not only are masts made to great advantage in the manner described, but also top-masts, club and gaff topsail poles, spinnaker-booms, and all spars. In addition to the advantages already enumerated, spars and masts thus made will always remain bright and will not blister. Thus the annoyance of frequently scraping is entirely done away with.

I claim—

1. A hollow mast whose shell is composed of longitudinal strips gouged out between the joints to form a corrugated interior, substantially as and for the purposes described.
- 5 2. A hollow mast whose shell is made of a number of longitudinal strips secured together around internal supporting-rings, F F, placed at intervals in the interior of the mast, substantially as described.
- 10 3. A hollow mast whose shell is made of two or more longitudinal strips, the inside joints of which are covered with suitably-prepared strips of cloth and paper, as and for the purpose substantially as described.
- 15 4. A hollow mast consisting of a shell cov-

ered with an inner spiral coating of cloth, an outer coating of paper, and suitable water-proof material, substantially as described.

5. A hollow mast consisting of a shell covered with an inner spiral coating of cloth 20 treated with a compound of white lead and glue, a coating of paper treated with said compound, and an outer coating of water-proof varnish, substantially as described.

In witness whereof I have hereunto set my 25 hand.

JAMES W. MANSFIELD.

Witnesses:

WM. B. H. DOWSE,

ALBERT E. LEACH.