Aug. 31, 1937. A. JUNGE 2,091,861

WOODEN MAST

Filed July 22, 1935

Fig.1.

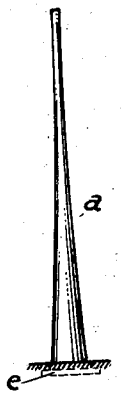


Fig.2.

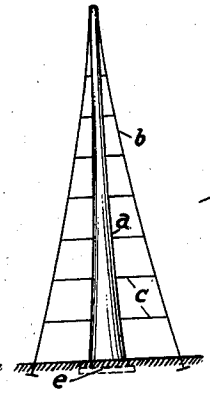
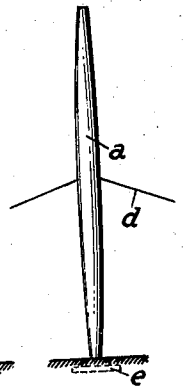


Fig.3.



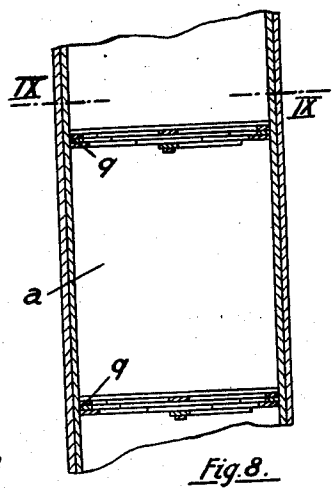


Fig.8.

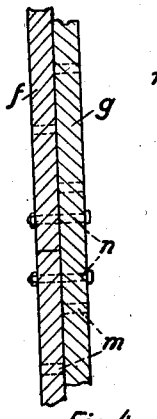


Fig.4.

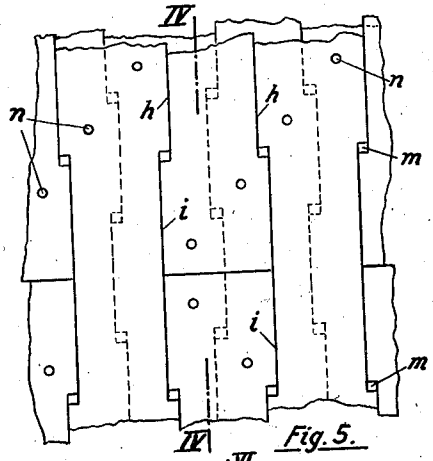


Fig.5.

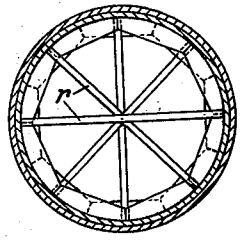


Fig.9.

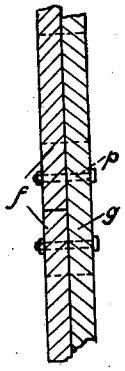


Fig.6.

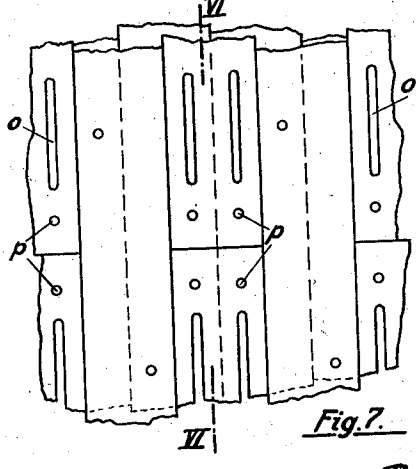


Fig.7.

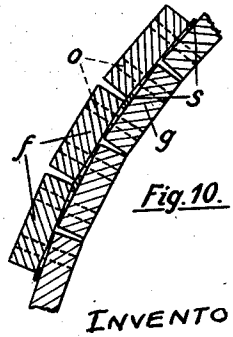


Fig.10.

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WOODEN MAST

Alfred Junge, Altona-Othmarschen, Germany

Application July 22, 1935, Serial No. 32,600
In Germany August 17, 1934

7 Claims. (Cl. 20—99)

This invention relates to wooden masts, more particularly such as are employed in wireless communication as aerial supports, and has for its object to provide certain improvements therein, hereinafter set forth.

Wooden masts of known construction suffer from the defect, that being of girder construction they are exposed too freely to the destructive influences of the weather and do not offer security against collapse over a sufficiently long period.

It has also been proposed to provide hollow wooden masts built up of a plurality of layers of planks or boards, but the practical establishment of these has met with failure partly because no economical method is known to make them stand up with safety and the costs of erection and maintenance are too high, and partly because of the limitations as to size. In particular, in all known wooden masts the joints are liable to be destroyed by rot and the like brought about by weather conditions, rain and moisture. But in spite of these defects of the wooden masts, they possess certain advantages in operation owing to the fact that their material is non-conductive and the absence of interference phenomena experienced when metal masts are employed.

Now, the present invention has for its object to provide a wooden mast which, while possessing the advantages useful from the electrical point of view, lacks the defects of the known wooden masts, such as insufficient strength and safety in operation over a sufficiently prolonged period, involved and expensive construction and insufficient protection against the inclemencies of weather.

This object is achieved by the provision of a wooden mast comprising a plurality of layers of planks, the joints of the planks being staggered longitudinally and transversely of the mast and the longitudinal rows of planks being arranged to intermesh and the layers being bolted together substantially at right angles to their own plane. The planks may be held together substantially at right angles to the layers by means of bolts and boards or plank like wooden members passing through the layers of planks.

According to a further feature of the invention, the hollow body formed of the layers of planks is additionally held together inside by stiffening rings comprising wooden members disposed in staggered formation and glued or dowelled together and to the planks, said wooden members being further stiffened by wooden cross members.

Various embodiments of the invention are illustrated by way of example in the attached drawing, wherein:—

Fig. 1 shows an unsupported wooden mast,

Fig. 2 is a view of a wooden mast secured by guy ropes and horizontal cables,

Fig. 3 shows a wooden mast with single guy ropes,

Figs. 4 and 5 illustrate fragments of the hollow body formed of double layers of planks, with staggered joints and intermeshing rows, in side elevation and section on the line A—B of Fig. 5,

Figs. 6 and 7 show fragments of another hollow body with wooden members disposed alongside the grain as connecting means for the layers of planks, in elevation and section on the line C—D of Fig. 7,

Fig. 8 is a longitudinal sectional view through a hollow body,

Fig. 9 is a cross sectional view of the line 9—9 of Fig. 8,

Fig. 10 illustrates a method of construction of the walls of the hollow body shown in Figs. 6 and 7, in section on the line 9—9 of Fig. 8.

Referring to Figs. 1 to 3 of the drawing, *a* is the wooden mast formed as a hollow body and comprising several layers of planks. The wooden mast may be constructed as shown in Fig. 1 without anchorage, with guy ropes *b* and cross or horizontal pull members *c* according to Fig. 2, or with single guy ropes *d* as illustrated by Fig. 3. The hollow body *a* is provided with a base *e* in a well known manner, while the guy ropes *b* or *d* are anchored to the ground.

In the embodiment shown in Figs. 4 and 5 the hollow body *a* comprises two superimposed layers of planks *f* and *g*, the joints of which are staggered longitudinally and transversely of the mast and arranged to intermesh in the longitudinal direction of the mast, being also bolted together substantially at right angles to the plane of the layers *f*, *g*. The gaps necessary between the tooth like projections *h* and *i* of adjacent planks for the assembly of individual planks are filled up by pieces of wood or wedges driven in fast, while the layers of planks *f* and *g* are held together by wooden or metal bolts *n*.

In the embodiment according to Figs. 6 and 7 two layers of planks *f* and *g* with joints staggered in the longitudinal and transverse direction are held together by boards or plank like wooden members *o* disposed substantially at right angles to the layers and passing therethrough, as well as by bolts *p*. The boards or plank like members *o* are driven into the layers of planks so as to be equigrained therewith and are fixed to the layers of planks by metal bolts, wooden nails or gluing.

As will be seen in Figs. 8 and 9, the layers of

planks of the hollow body *a* are additionally stiffened on the inner side by stiffening rings *q* having struts *r* which may be disposed chord fashion or may intersect. The stiffening rings *q* comprise wooden members disposed in staggered relationship and connected to one another as well as to the planks by gluing, dowels or the like.

The individual planks of the superimposed layers of planks *f*, *g* may be suitably curved or flat. When the planks are flat laths *s* or the like may be placed under the joints of the outer layer of planks, to act as filling pieces. The outer surface of the hollow body *a* is preferably coated with a waterproof skin, such as impregnated cardboard, as a protection against weather conditions and the penetration of moisture. The layers of planks of the hollow body *a* may be connected to the base by means of steel anchoring members having steel dowels let into the planks. The erection of the wooden mast from the layers of planks with the inner and outer reinforcements and strutting may be effected in a simple manner by starting with the layers of planks located at the lower end of the mast and superimposing the subsequent layers of planks with lifting tackle or in any other suitable manner until the required height of the mast is attained and the hollow body *a* may be connected to the base and the guy ropes *b* may be fixed to the appropriate ground anchorage. The individual parts of the mast may also be completed wholly or in part per se, and the individual parts superimposed and interconnected.

The embodiments described and illustrated by way of example may be modified in numerous ways in adaptation to particular practical requirements without thereby leaving the scope of the invention. Thus, for example, instead of two layers of planks several layers may be employed in building up the hollow body *a*. The individual planks of the hollow body *a* may be interconnected in the manner described and illustrated, or in any other suitable manner. If desired, the inner bracing and strutting of the hollow body *a* may be executed in metal, provided this does not cause electrical interference. If the wooden mast is used as an aerial support, parts of the guy ropes may be utilized as aerials.

What I claim is:—

1. A wooden mast, comprising a plurality of layers of planks forming a hollow body, the individual planks having their joints staggered longitudinally and transversely of the mast, the longitudinal rows of planks having intermeshing teeth and the layers of planks being held together by connecting means passing through the layers of planks substantially at right angles to the plane thereof.

2. A wooden mast, comprising a plurality of layers of planks forming a hollow body the individual planks having their joints staggered longitudinally and transversely of the mast, the longitudinal rows of planks having intermeshing teeth and the layers of planks being held together by means passing through the layers of planks substantially at right angles to the plane thereof and by inner stiffening rings.

3. A wooden mast, comprising a plurality of layers of planks forming a hollow body, the individual planks having their joints staggered longitudinally and transversely of the mast, the longitudinal rows of planks having intermeshing teeth and the layers of planks being held together by means passing through the layers of planks substantially at right angles to the plane thereof and by inner stiffening rings comprising staggered wooden members connected to one another and to the planks.

4. A wooden mast, comprising a plurality of layers of planks forming a hollow body, the individual planks having their joints staggered longitudinally and transversely of the mast, the longitudinal rows of planks having intermeshing teeth and the layers of planks being held together by means passing through the layers of planks substantially at right angles to the plane thereof and by inner stiffening rings having inner struts.

5. A wooden mast, comprising a plurality of layers of planks forming a hollow body, the individual planks having their joints staggered longitudinally and transversely of the mast, the longitudinal rows of planks having intermeshing teeth and the layers of planks being held together by connecting means passing through the layers of planks substantially at right angles to the plane thereof and filling pieces disposed at the joints of the planks between the layers of planks.

6. A wooden mast, comprising a plurality of layers of planks forming a hollow body, the individual planks having their joints staggered longitudinally and transversely of the mast, the longitudinal rows of planks having intermeshing teeth and the layers of planks being held together by connecting means passing through the layers of planks substantially at right angles to the plane thereof and a waterproof skin applied to the outer surface of the mast.

7. A wooden mast, comprising a plurality of planks forming a hollow body, the individual planks having their joints staggered longitudinally and transversely of the mast, the longitudinal rows of planks having intermeshing portions and the planks being held together by inner stiffening rings having inner struts.

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