

Oct. 8, 1946.

H. A. MOORE

2,409,060

LIGHT WEIGHT MAST

Filed June 11, 1943

2 Sheets-Sheet 1

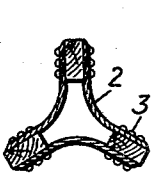


Fig. 2

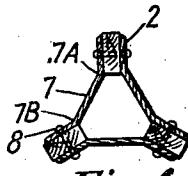


Fig. 4

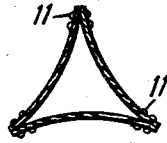


Fig. 6

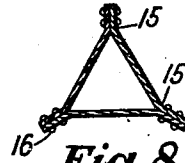


Fig. 8

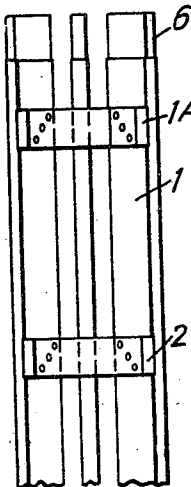


Fig. 1

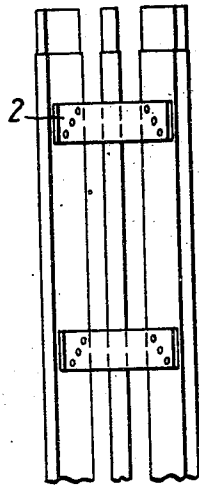


Fig. 3

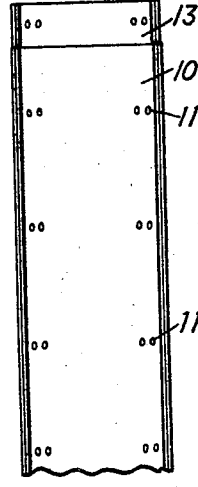


Fig. 5

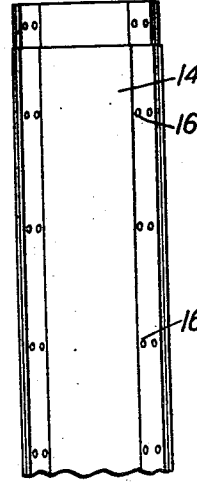
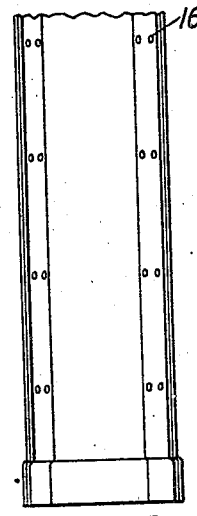
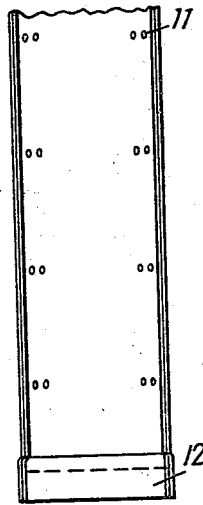
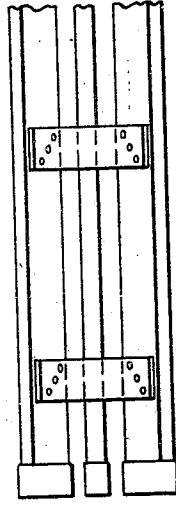
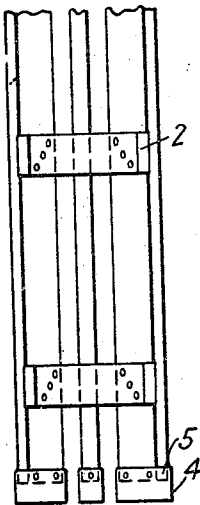


Fig. 7



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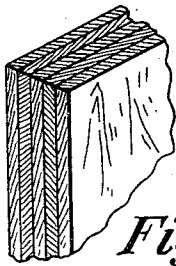


Fig. 9

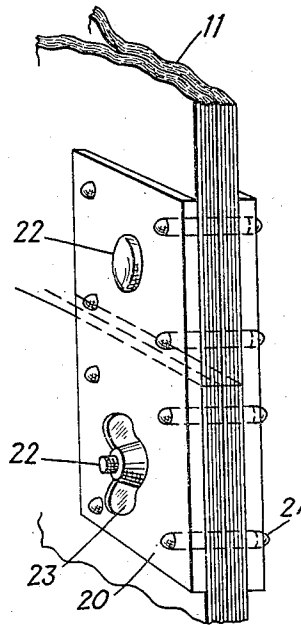


Fig. 10

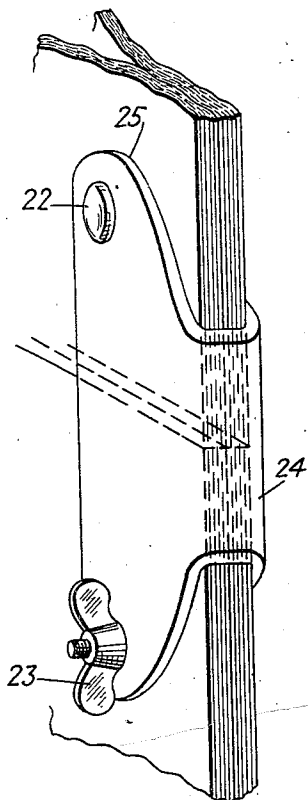


Fig. 11

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UNITED STATES PATENT OFFICE

2,409,060

LIGHTWEIGHT MAST

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Delaware

Application June 11, 1943, Serial No. 490,441

4 Claims. (Cl. 20-99)

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This invention relates to new and useful light weight masts which are particularly useful in connection with the erection of radio antennas.

An object of this invention is to provide improved light weight efficient masts.

Another object of this invention is to provide simple inexpensive masts having a minimum number of parts and which, when used to support a radio antenna, will give minimum electrical losses at certain high frequencies.

Still another object of this invention is to provide light weight masts which will be sectional in construction for portable radio equipment.

A feature of this invention is the assembly of three parallel upright members which are bound together by rungs or bent cross rails forming a ladder type of construction, and in another modification the antenna is constructed of laminated wood sections to make a three-sided mast which can easily be erected for supporting another device.

Another feature of this invention is the novel arrangement of an open or ladder type mast wherein there is provided the ability with which a mast of this type can be climbed up by the radio station personnel for repairs or radio installations.

In the prior art light weight masts thin metal tubes have been used, also wooden poles. In sectional masts for portable equipment telescoping metallic tubes or wooden poles with metal end tubes for joining the sections together have been used. These prior art devices have proved to be expensive to construct, also heavy in weight and cumbersome to carry. My invention overcomes the objections of the prior art by having a structural arrangement of assembled wooden members which provide an efficient light weight mast of considerable strength for their given weight. The masts of this invention may be constructed as a single structural unit, particularly wherein the open or ladder type of construction is provided. In this construction it would mean that the side rails would be a continuous laminated piece running the whole length or pieces permanently fastened to form the rails. The rungs or bent pieces could be added or installed to fabricate the complete antenna mast unit. Also, when the sections are formed to provide a single mast unit, the laminations may be arranged to be at a maximum diameter either at the base or at some point between the ends of the mast; more likely at the midpoint of the mast thereby giving greater stiffness to the midpoint of the mast.

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Furthermore, the three sided mast structure of this invention reduces the cost of construction.

This invention will best be understood by referring to the accompanying drawings in which:

Fig. 1 is a longitudinal elevation of one form of mast of this invention,

Fig. 2 is a cross-section of Fig. 1,

Fig. 3 is a modification of Figs. 1 and 2, wherein the cross-members are built up of straight sided bent members,

Fig. 4 is a cross-section of Fig. 3,

Fig. 5 is an elevation of a further modification of this invention,

Fig. 6 is a cross-sectional view of Fig. 5,

Fig. 7 is an elevation of a section of a mast which is somewhat similar to that of Figs. 5 and 6 except that the sides are straight and not curved,

Fig. 8 is a cross-section of Fig. 7,

Fig. 9 is a perspective view showing a portion of the side rails of the laminated sections shown in Figs. 5 to 8, inclusive,

Fig. 10 is a detail of a form of end fastening construction, and

Fig. 11 is a detail of another form of end fastening construction.

Referring now in detail to Figs. 1 and 2 of the drawings, there are shown three parallel arranged rails 1 of straight grained airplane spruce which may be slotted slightly at 1A to receive curved rungs 2 which may be of any suitable hard wood such as, for example, white oak, hickory or maple. If maximum strength is required the slots at 1A may be eliminated. The rungs 2 are bent by any suitable process such as steaming or laminating and gluing to give a suitable radius for connecting the guide rails 1. The rungs 2 are secured in place in the slots 1A by waterproof glue and wagon box type rivets 3. Where a stronger type of construction is required, the slots 1A may be omitted. The lower ends of guide rails 1 are provided with metallic ferrules 4 which are fastened to rails 1 by means of rivets 5. The ferrules 4 extend beyond the rails 1 to receive an adjacent section which is reduced in size at the upper portion of the rails as indicated at 6. The mast of this invention is not limited to any particular dimension. I have found, however, a convenient length of a section to be 7 feet with the cross rungs 2 placed approximately 14 inches apart, the width of the rails being two and a half inches by one and an eighth inches thick, the cross rungs two and a half inches wide and three-eighths of an inch thick.

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The modifications shown by Figs. 3 and 4 are somewhat similar to those shown by Figs. 1 and 2 except that the cross rungs 7 are not curved but are bent at an angle as shown. The rungs 7 are of hard wood and are bent at 7A and 7B to form the triangular arrangement of the side rails, the mast being held together by glue and rivets 8, similar to those described in connection with Figs. 1 and 2.

Figs. 5 and 6 show an antenna mast constructed of laminated wooden sides 10 curved in a manner similar to that shown in Figs. 1 and 2. The three laminated sides 10 are glued and riveted at suitable intervals to give sufficient strength by means of a plurality of rivets 11. The lower portion is provided with a single metallic ferrule 12 which extends beyond the members 10 to mesh with the portion of reduced section indicated at 13 shown in the upper portion of Fig. 5.

The modification shown by Figs. 7 and 8 is somewhat similar to that shown by Figs. 5 and 6 except that the side members 14 are not curved but are bent at 15 to form guide rails. The side sections 14 are riveted and glued together at suitable intervals by means of rivets 16.

Fig. 9 shows how the veneer or laminations in the modifications shown by Figs. 5, 6, 7 and 8 are glued together by waterproof glue to give maximum strength, and although the construction should not be limited to an exact number of laminations, I have found a section composed of 5 ply veneer to be most satisfactory with 3 of the ply arranged lengthwise and 2 of the ply crosswise.

The end fastening construction shown in detail by Fig. 10 is composed of two metallic plates 20 having metal pins 21 constructed of steel or brass. The metal pins are driven tight in the wood and are arranged to fit sufficiently loose in the metallic plates 20 to be readily removable, but not sufficiently large enough to give undue play which might prevent the straight upright alignment of the antenna mast. The plates 20 are clamped tightly between the laminated wood members 11 by means of two metallic bolts 22 alternately arranged with the heads located on opposite plates. The bolts 22 are tightened by means of a wing nut 23.

The other modification of end fastening construction, as shown by Fig. 11, is that of a metallic member 24 which is bent in the form of a U to surround a portion of the end section of laminated wood members 11. The member 24 has extending wing portions 25 which are provided with apertures for bolts 22 and wing nuts 23. In this type of construction the two sections are taken apart by merely loosening either one or both of the two wing nuts 23, taking out the bolts 22 and removing the U shaped clamp member 24 from either one or both of the sections as may be desired.

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While I have indicated and described a system for carrying my invention into effect, it will be apparent to one skilled in the art that my invention is by no means limited to the particular structures shown and described, but that many modifications may be made without departing from the scope of my invention.

What I claim is:

1. A lightweight mast composed of one or more sections, each comprising three parallel arranged wood rails substantially symmetrically related each to the other, corresponding recesses spaced along the length of said rails on each side thereof, bent rungs retained in said recesses, said rungs serving as steps and as means for retaining said rails as a unit, said rails being of reduced dimensions at each end and having enlarged recessed portions than the other end thereof so that the sections may be partially telescoped to extend the mast as desired.

2. A light weight mast composed of one or more sections, each section comprising three parallel arranged rails of wood, said rails being substantially symmetrically related each to the other, corresponding recesses spaced along the length of said rails on each side thereof, wooden rungs of laminated wood retained in said recesses, said rungs serving as steps and as means for retaining the rails as a unit, said rails being of reduced dimensions at one end and having an enlarged recessed portion at the other end thereof so that the sections may be partially telescoped to extend the mast as desired.

3. A light weight mast composed of one or more sections, each section comprising three parallel arranged rails of light weight wood, said rails being substantially symmetrically related each to the other, corresponding recesses spaced along the length of said rails on each side thereof, wooden rungs retained in said recesses, said rungs serving as steps and as means for retaining the rails as a unit, said rails being of reduced dimensions at one end, a metallic ferrule forming an enlarged recessed portion at the other end of said rail so that the sections may be partially telescoped to extend the mast as desired.

4. A light weight mast composed of one or more sections, each section comprising three parallel arranged rails, the width dimensions of the surfaces of the rails being angularly disposed 120° apart, said rails having widely spaced slots on each side thereof, a plurality of bent rungs arranged to be located within said widely spaced slots and secured to said rails by a plurality of rivets, said rungs and rivets serving to hold said rails together as a unit, said rails being of reduced dimension at one end thereof and having an enlarged recessed portion at the other end thereof so that the sections of the mast may be partially telescoped together.

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