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SECTIONAL MAST AND ELEVATING MEANS THEREFOR

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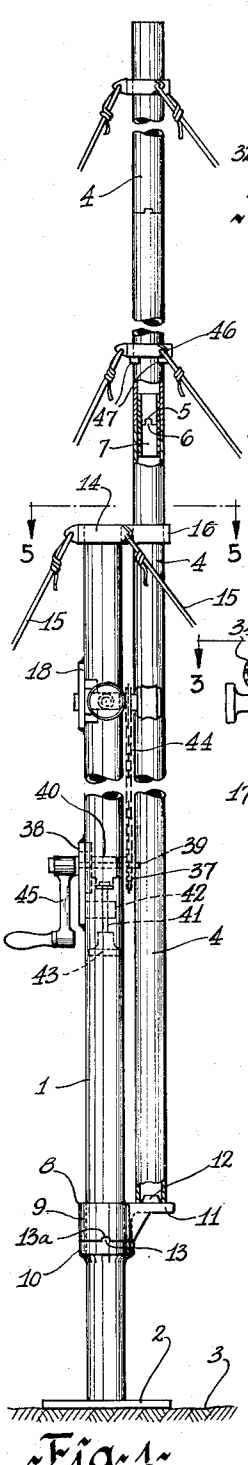


Fig. 1.

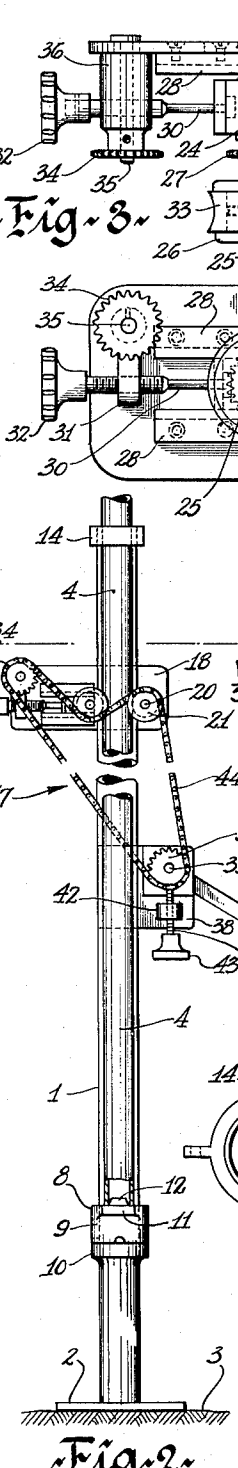


Fig. 2.

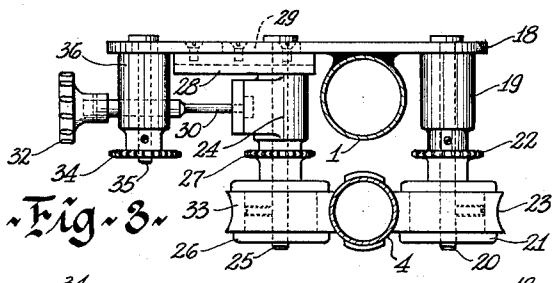


Fig. 3.

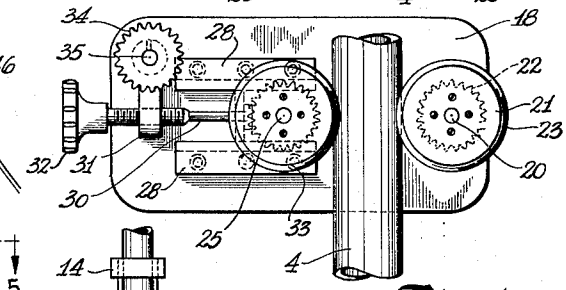


Fig. 4.

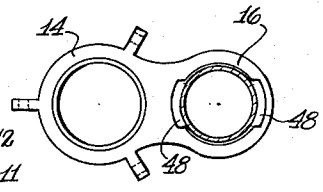


Fig. 5.

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# SECTIONAL MAST AND ELEVATING MEANS THEREFOR

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This invention relates to sectional masts and elevating means therefor.

It is frequently necessary to provide a supporting mast to carry radio and television antennae and other instruments as well as for various other purposes. The problem of providing easy, convenient and inexpensive means for erecting such masts is well recognized and has received much attention. Various types of so-called "self-erecting" masts have heretofore been proposed. Most of such prior structures involve the use of a telescopic sectional mast but the erection means therefor is usually of complicated and involved nature.

It is an object of this invention to provide a sectional mast which is simple in structure, which incorporates therein an elevating means of simple, effective and positive operation, and wherein such elevating means may be quickly and conveniently activated to erect the mast.

The invention resides in a mast having an upright base, a support carried by said base section for supporting mast sections in parallel relation to said base, and elevating means mounted in said base and engageable with one of said mast sections to elevate the same.

The invention will be described with reference to the accompanying drawing, in which

FIGURE 1 is a side elevation of a mast in accordance with the invention,

FIGURE 2 is a partial elevation of another side of said mast,

FIGURE 3 is a plan view of the elevating mechanism,

FIGURE 4 is an enlarged side elevation of the elevating mechanism, and

FIGURE 5 is a plan view of a guy ring and mast guide.

In the drawing, 1 is a tubular base section having a base plate 2 and adapted to be erected in upright position on a base surface 3.

The mast proper comprises a plurality of tubular sections 4. Means are provided for coupling sections 4 in longitudinal alignment and comprises, as shown, a pair of opposed recesses 5 in one end edge of each section and complementary projecting lugs 6 on the other end edge thereof. A short length of tubing 7 is fixed internally within the latter end of each section 4 and projects outwardly therefrom whereby when the end edges of two sections are in engagement the lugs 6 will enter recesses 5 and the tubing 7 will underlap both sections to rigidly hold them together. It will be observed that such coupling means will secure the sections together in mutually non-rotative relation but that if rotative force is applied to one section, the other intercoupled sections will rotate therewith.

A mast rest 8 is mounted on base section 1 adjacent the lower end thereof and comprises a sleeve 9 rotatably carried by section 1 and arranged to be seated upon an annular shoulder 10 fixed to the section 1. Sleeve 9 has a laterally projecting arm 11 on the upper surface of which the end of a mast section 4 is adapted to rest. Arm 11 has a circular projection 12 arranged to project interiorly of a mast section to position the latter thereon. The normal mast supporting position of rest 8 is defined by means of a lug 13 on shoulder 10 and complementary recesses 13a in sleeve 9.

Fixed to the upper end of base section 1 is a guy ring 14 to which guys 15 may be attached and having a laterally projecting mast section guide ring 16.



It will be apparent that, with rest 8 rotated out of mast section engaging position, one or more coupled mast sections 4 may be inserted in guide ring 16 and moved upwardly therethrough. Thereafter, the rest is swung back into mast supporting position and the sections dropped to place the lower end thereof into engagement with the arm 11, as shown in FIGURES 1 and 2.

The distance between arm 11 and guide ring 16 is of substantial length (say, eight feet) whereby adequate support is applied to the lower portion of the coupled mast sections 4.

Elevating means for mast sections supported on arm 11 and guide ring 16 is mounted on base section 1 and is generally indicated at 17. Such means comprises a bearing bracket 18 welded or otherwise secured to section 1, a bearing 19 fixed to the bracket, an axle 20 journalled therein, and a roller 21 and sprocket 22 mounted on the axle. The roller 21 has a groove peripheral member 23 of hard rubber or like frictional material. The grooved surface contour of the member 23 is complementary to that of the cylindrical surface of a mast section 4 for uniform engagement therewith. As clearly shown in FIGURE 3, the axis of roller 21 is normal to that of a mast section 4 when the latter is supported on arm 11 and guide ring 16 and the peripheral surface of member 23 is in frictional engagement with such mast section.

Adjustably mounted on bracket 18 is a second bearing 24, an axle 25 journalled therein, and a roller 26 and sprocket 27 mounted on the axle. Bearing 24 is slidably mounted in guide bars 28, the end of axle 25 extending through a slot 29 in the bracket. A rod 30 is connected to bearing 24 and has a screw-threaded mounting in a block 31 fixed to the bracket. A handwheel 32 is fixed to the outer end of rod 30. Roller 26 is similar in all respects to roller 21 and has a grooved peripheral member 33 of frictional material. As shown in FIGURES 3 and 4, the axes of rollers 21 and 26 are parallel and the rollers are in opposed relation whereby, on actuation of the hand-wheel 32, mast section 4 may be frictionally gripped between the peripheries thereof or released when required.

Driving means for rollers 21 and 26 includes sprockets 22 and 27 as well as sprocket 34 mounted on axle 35 journalled in bearing 36 and also mounted on bracket 18. Sprocket 34 is located somewhat above the level of sprockets 22 and 27. A driving sprocket 37 is mounted in a bracket 38 fixed to section 1 below bracket 18. Sprocket 37 is mounted on an axle 39 journalled in a bearing 40 which is preferably mounted for vertical adjustment as by means of a rod 41 having screw threaded mounting in a block 42. A handwheel 43 fixed to rod 41 may be actuated to effect the desired adjustment. A chain 44 connects sprockets 22, 27, 34 and 37, the chain extending over an upper portion of sprocket 22 and a lower portion of sprocket 27 to drive such sprockets in opposite directions. Sprocket 37 is driven by means of a crank 45 mounted on axle 39.

In proceeding with erection of a mast, an initial length of mast sections is inserted through guide ring 16 and seated on arm 11, roller 26 being released to permit insertion of the mast sections between rollers 21 and 26.

Such initial length (usually consisting of two sections 4) is determined by the distance between arm 11 and ring 16. Moreover, the distance between arm 11 and rollers 21 and 26 is less than the length of one mast section 4 whereby the rollers may be placed in engagement with the lowermost mast section supported on arm 11.

The handwheel 32 is now actuated to place rollers 21 and 26 in frictional engagement with the length of mast sections and the elevating mechanism actuated to rotate rollers 21 and 26 and thus elevate the mast section length. The rest 8 is now swung out of arm supporting position and, when the mast length has been sufficiently elevated, a new section 4 is added to the lower end thereof and fed through the elevating rollers. This procedure is continued until a mast of desired length has been erected, following which rest 8 is swung back into supporting position and the mast lowered to place its lower end on arm 11 for permanent support thereon.

Means are preferably provided for guying the mast at desired levels thereof. Such means may comprise a guy ring 46 adapted to be placed on a section 4, each of which may be provided with a pair of opposed arcuate shoulders 47 on which the ring 46 may seat. The guide ring 16 is provided with recesses 48 to permit passage of the shoulders 47.

The mast described will be formed of suitable metal except as otherwise indicated. Preferably the tubular sections 1 and 4 are of lightweight metal such as aluminum.

I claim:

A sectional mast structure comprising a base section, a plurality of mast sections, means for coupling said mast sections in end to end relationship, a guide ring carried by said base section adjacent its upper end and extending laterally therefrom to receive a mast section in substantially parallel relation to said base section, a supporting rest for said mast sections swingably carried by said base section adjacent its lower end and having a sleeve on said base section, a shoulder on said base section supporting said sleeve, an arm on said sleeve engageable by the lower end of one of said mast sections, and means releasably retaining said sleeve and arm in a mast section supporting position with respect to said base section, said arm in said position being located in alignment with said ring for engagement with the end of a mast section extending through said ring, the distance between said arm and ring being less than the length of one of said mast sections, and elevating mechanism for said mast sections comprising a bracket fixed to said base section between said rest and guide ring, a roller having a fixed axis mounted on said bracket, a second roller having a bearing slidably mounted on said bracket for movement towards and away from said first roller, said rollers being disposed on one side of said bracket with the area between the ends of the rollers remote from the bracket being free of obstructions thereby enabling a mast section to be moved laterally between the rollers when the rollers are moved apart, the axes of said rollers being normal to the axes of said mast sections, each said roller having a frictional peripheral surface engageable with one of said mast sections to frictionally clamp one of said mast sections therebetween, a sprocket fixed to each of said rollers and disposed between the bracket and rollers, a manually drivable sprocket mounted on said base section, and a chain connecting said sprockets to drive said roller sprockets in opposite directions in response to rotation of said manually drivable sprocket, said chain and sprocket drive enabling adjustment of the rollers in relation to each other for elevating mast sections of different diameters.



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