March 27, 1956 E. J. FOSTER 2,739,673

AERIAL MASTS

Filed May 26, 1952 2 Sheets-Sheet 1

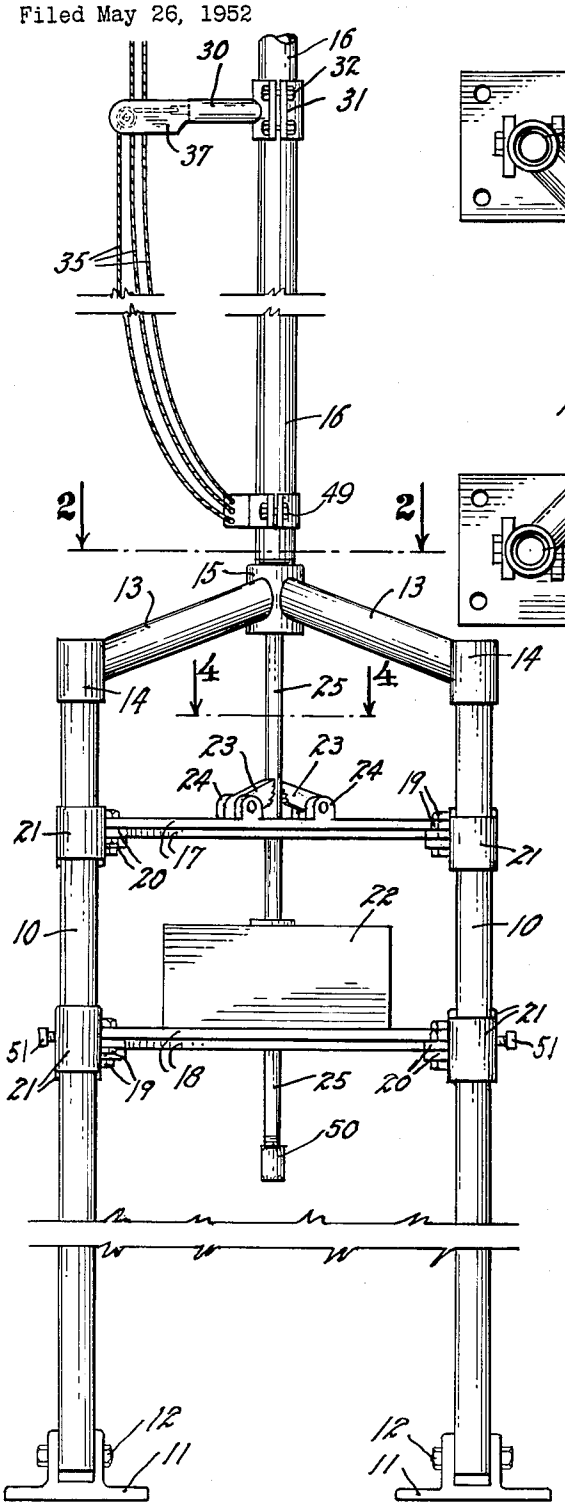


Fig. 1

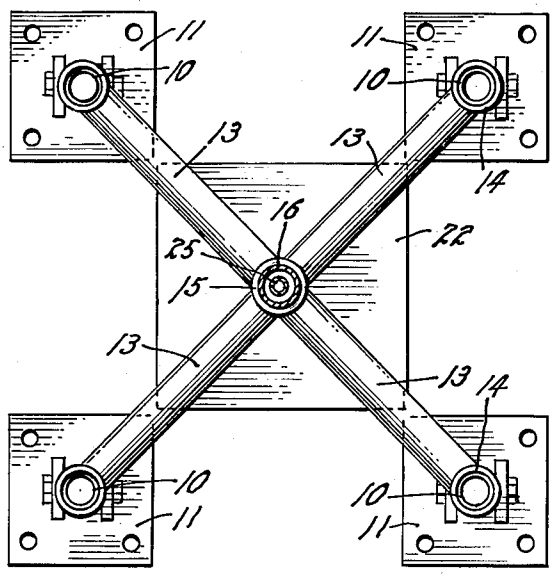


Fig. 2

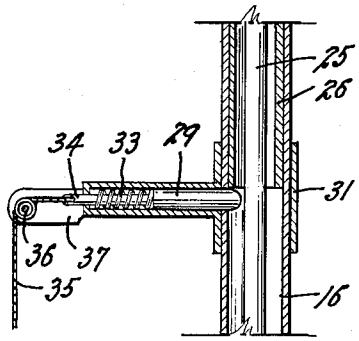


Fig. 3

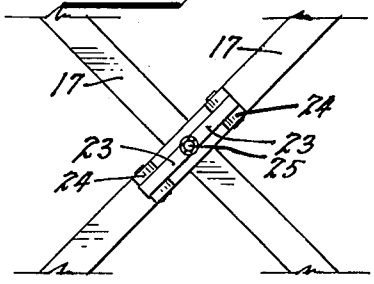


Fig. 4

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AERIAL MASTS

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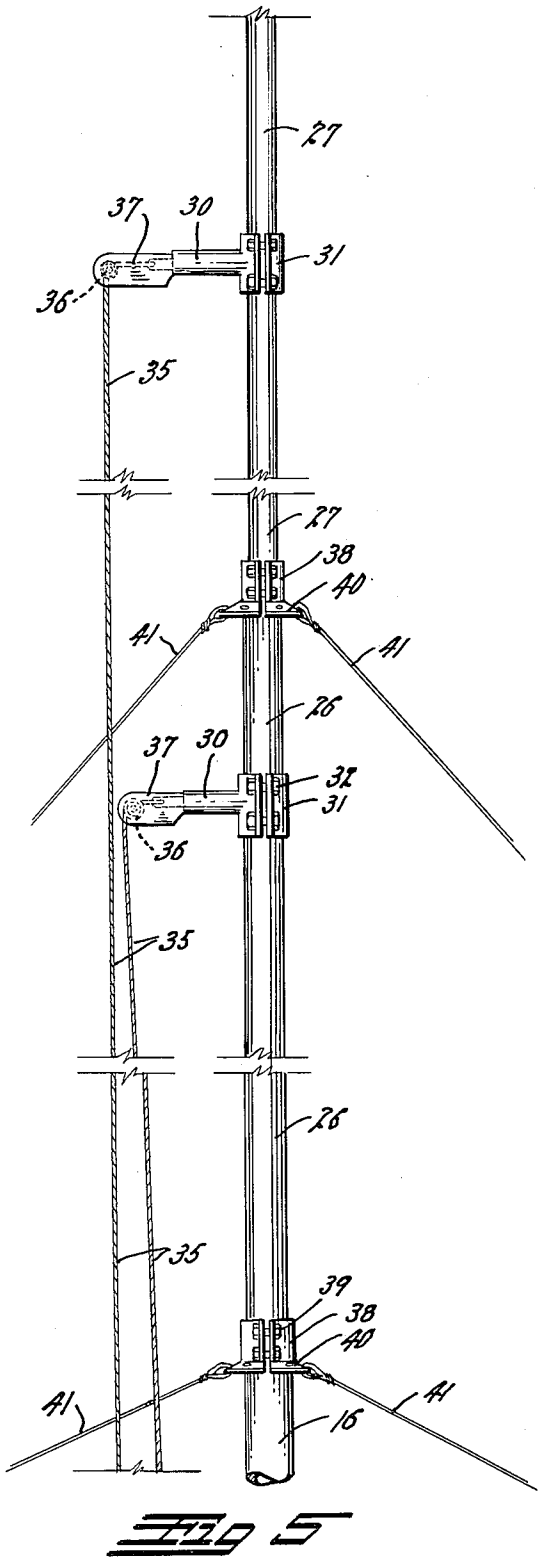


Fig 5

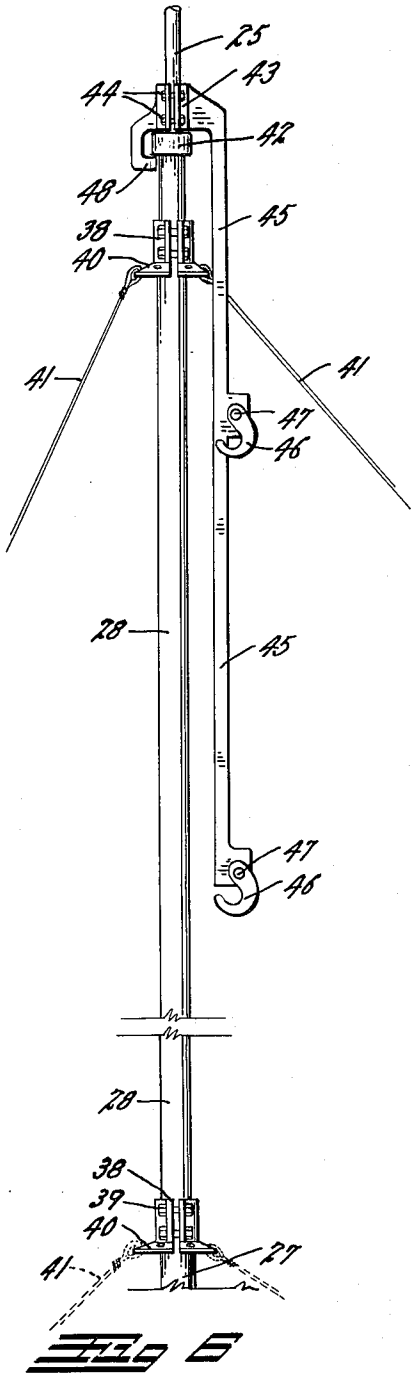


Fig 6

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AERIAL MASTS

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8 Claims. (Cl. 189—26)

This invention relates to a mast for supporting an aerial, and is more particularly designed for use with directional television aerials. The principal objects of the invention is to provide an aerial mast construction which can be quickly and easily erected to any desired height without requiring scaffolding, hoisting apparatus, or other paraphernalia.

Another object of the invention is to so construct the aerial mast that it will be substantially self-erecting, that is, so that it may be extended vertically from a fixed position in very limited space, and so that it may be quickly and easily lowered for repairs and replacements to the aerial, without requiring horizontal space for the mast.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is a fragmentary side view of the lower portion of the improved mast and its supporting base;

Fig. 2 is a horizontal cross-section, looking downwardly on the line 2—2, Fig. 1;

Fig. 3 is a detail section through a supporting latch employed in the improved aerial mast;

Fig. 4 is a detail, horizontal section, taken on the line 4—4, Fig. 1;

Fig. 5 is a fragmentary side view of the mid-section of the improved mast; and

Fig. 6 is a similar side view of the top section thereof.

The improved mast is supported from an open rectangular base frame consisting of four pipe posts 10 arising from tiltable and adjustable base shoes 11 which are secured to the pipe posts 10 by means of attachment bolts 12. The four posts 10 are held in fixed, rectangular relation by means of diagonal pipes 13 welded, or otherwise mounted on, suitable pipe couplings 14 on the upper extremities of the posts 10. The diagonal pipes converge to a common central coupling 15 into which a lower or first tubular mast member 16 is threaded or otherwise vertically mounted.

The posts 10 are braced and held in vertically spaced relation by means of an upper pair of diagonal crossed bars 17 and a lower pair of diagonal crossed bars 18. The bars 17 and 18 are secured at their extremities, by means of attachment bolts 19, to ears 20 formed on pipe sleeves 21 which are fixedly mounted on the posts 10. The lower pair of crossed bars 18 supports an antenna-rotating mechanism of any of the conventional types, illustrated mounted in a rotator enclosure 22. The upper pair of crossed bars 17 supports two oppositely-acting gripping dogs 23 which are swingingly mounted in supporting ears 24 on one of the bars 17.

A sectional axis pipe 25 extends through the crossed bars 18 and through the rotator enclosure 22, thence upwardly through the crossed bars 17 and between the gripping dogs 23, and axially upward through the lower first mast member 16. The axis pipe is formed in sections, each section being shorter than the distance between the upper cross bars 17 and the roof or other supporting surface upon which the base is mounted. The sections are successively secured together by means of suitable pipe couplings 50.

A second tubular mast member 26 extends upwardly from the first mast member 16. A third tubular mast member 27 extends upwardly from the second mast member 26, and a fourth tubular mast member 28 extends upwardly from the third mast member 27. Each mast member is formed from pipe or tubing, and is snugly, slidably and telescopically mounted in the next lowermost member so that all may be nested within each other to have a total closed length very little in excess of the length of a single mast member.

Each successively higher mast member is supported, when fully extended, by means of a withdrawable latch 29 mounted in a guide tube 30 projecting from a split clamp 31 which can be clamped on the mast member by means of suitable clamp bolts 32. The latch construction for all of the mast members is similar, and in each a compression spring 33 constantly urges the latch 29 forwardly. A latch stem 34 projects rearwardly from the tube 30, and a withdrawing cable 35 is connected to the stem 34 to withdraw the latch 29 from its mast member. The withdrawing cables are trained over guide rollers 36 supported in side ears 37 secured to and projecting outward from the tubes 30. For convenience, all of the cables 35 are tied to a cable clamp 49 to prevent them from swaying in the wind.

A clamping sleeve 38 is clamped about the upper extremity of each mast member by means of suitable clamp bolts 39. Each clamping sleeve is formed with a projecting, downwardly inclined peripheral flange 40 about its bottom, having perforations through which the upper extremities of guy wires 41 are attached.

A ball thrust bearing 42 is secured in the top of the fourth or uppermost mast member 28 and supports an axis pipe clamp 43, which is fixedly clamped to the axis pipe 25 by means of suitable clamp screws 44. The axis pipe 25 projects upwardly from the fourth or uppermost mast member any desired distance to support any desired type of television aerial.

An erecting bar 45 is suspended from an arm projecting from the axis pipe clamp 43 and extends downwardly in parallel relation to the vertical axis of the mast. The erecting bar 45 is provided with freely swinging upped and lower hooked members 46 pivoted to the bar by means of suitable pivots 47. The hooked members 46 are vertically spaced apart and positioned so that they may be manually swung inwardly beneath and into engagement with the flanges 40 on the second and third mast members 27 and 28.

The axis pipe clamp 43 is also provided with a hook 48 which extends downwardly and inwardly below the thrust bearing 42.

Let us assume that the base shoes 11 have been mounted on a roof or other supporting structure to rigidly support the posts 10 in vertical position, that all of the mast members are nested within the lower mast member 16, with the axis pipe 25 projecting therebelow, and that the members 18 and 22 have been temporarily removed.

The operator now pushes the axis pipe 25 upwardly, additional sections being added as necessary by means of the couplings 50. This causes the hook 48 to pull the fourth mast member 28 upwardly in the third mast member 27. As the upper hook member 46 approaches the flange 40 of

the third mast member 27, the hook member is manually swung inwardly beneath the latter flange and the third mast member 27 will be drawn upwardly by the upper hook member 46. As the lower hook member 46 approaches the flange 40 of the second mast member 26, the latter hook member is manually swung inwardly beneath the latter flange and the second mast member will be drawn upwardly by the lower hook member 46 and from the first mast member 16. The weight imposed upon the two hook members 46, assisted by the incline of the flanges 40, securely holds the hook members in firm frictional engagement with the flanges and prevents the former from swinging outwardly from the latter until the load is released upon the hook members.

The dogs 23 serve to support the load on the axis pipe as sections are added thereto.

When the second mast member 26 reaches its fully extended position the latch 29 in the first mast member 16 will snap therebeneath to support the second mast member therein. The guy wires 41 suspended from the flange 40 of the second mast member 26 are now secured to the roof or other fixed support to rigidly support the second mast member in a vertical position.

The operator now lowers the axis pipe sufficiently to relieve the load on the lower hook 46 so that the latter may swing outwardly away from the flange 40 on the clamp 39 of the second fixedly-supported mast member 26.

Additional sections are now added to the axis pipe and the latter is forced upwardly to carry the third and fourth mast members 27 and 28 upwardly in the second mast member 26 until the latch 29 in the upper extremity of the second mast member 26 snaps beneath the lower extremity of the third mast member 27 to fixedly support the latter. The guy wires suspended from the flange 40 of the third mast member are now fixedly attached to support the third mast member in a fixed vertical position.

The operator now lowers the axis pipe 25 sufficiently to relieve the load on the upper hook 46 so that the latter may swing freely outward away from the flange 40 on the clamping sleeve 39 on the upper extremity of the now fixedly supported third mast member 27.

Additional sections are now added to the axis pipe and the latter are forced upwardly to cause the hook 48 to carry the fourth mast member 28 upwardly in the third mast member 27 until the latch 29 at the upper extremity of the third member 27 snaps beneath the fourth mast member 28.

The final guy wires, suspended from the flange 40 of the fourth mast member 28, are now attached to the roof or other fixed structure to support the fourth mast member 28 rigidly vertical. The dogs 23 are now released, the cross members 18 are placed in position and any suitable aerial rotating mechanism installed on the axis pipe as indicated by the rotator housing 22.

Before erection, a television aerial of any of the conventional types is fixedly mounted on the upper extremity of the axis pipe 25 above the axis pipe clamp 43 and before erection the upper extremities of all guy wires 41 are secured to their respective flanges 40. After erection, the entire load of the aerial and axis pipe is supported on the anti-friction bearing 42.

To reach the aerial for replacement or repairs, it is only necessary to engage the dogs 23, then lift the axis pipe to release the load on the upper latch 29 so that the latter may be withdrawn by means of its cable 35 to allow the fourth member to be lowered. This is repeated with the third and second mast members, all being lowered successively by removing sections from the axis pipe 25 in the reverse order of the erection process.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

1. An aerial mast comprising: a hollow supporting base, a first tubular outer mast member fixedly mounted on said base and arising vertically therefrom; a plurality of tubular inner mast members telescopically fitted within each other and within said first tubular mast member; an axis member extending axially through all of said mast members and projecting upwardly and downwardly from the latter; means preventing relative axial movement between the innermost mast member and said axis member; means supported from the innermost mast member adapted to engage the remaining inner mast members so that as said axis member is moved upwardly, each inner mast member will be successively drawn upwardly in the next outermost mast member; and means on each mast member, with the exception of the innermost mast member, adapted to engage the lower extremity of and support the next within mast member in its upwardly extended position.

2. An aerial mast comprising; a hollow supporting base; a first tubular outermost member fixedly and vertically mounted in said base; a plurality of inner tubular slidable, telescopically-fitted mast members telescopically fitted within each other and within said first mast member; an axis member extending axially and rotatively through all of said mast members and projecting upwardly and downwardly beyond the latter; means acting to prevent relative axial movement between the innermost member and said axial member; means for supporting each mast member in its upwardly extended position in the next outermost mast member; a collar surrounding the upper extremity of each mast member; a guy wire flange on each collar; guy wires attached to said guy wire flanges; a withdrawable latch member mounted on each mast member below said collar; means urging each latch member into a position below the next innermost mast member to support the latter in its extended position; an erecting bar supported from the upper extremity of the innermost mast member and extending downwardly therefrom; and means on said erecting bar detachably engaging the guy wire flanges of the remaining inner mast members so that as said axis member is moved upwardly each inner mast member will be drawn upwardly in the next outermost mast member.

3. An aerial mast as described in claim 2 having a ratchet-like supporting device mounted in said base and arranged to removably engage said axis member to prevent downward movement thereof.

4. An aerial mast comprising: a plurality of fixedly supported supporting posts; a collar supported at the upper extremities of said posts intermediate the latter; a first mast member arising from said collar, the lower extremity of said first mast member terminating at said collar at its lower extremity; a second mast member slidable within the first mast member and extending thereabove; a third mast member slidable within the second mast member and projecting thereabove; a fourth mast member slidable within said third mast member and projecting thereabove; means on the first, second, and third mast members releasably supporting the next higher mast member therein; a sectional axis member extending through all of said mast members and projecting downwardly therefrom into said base, said axis member projecting upwardly above the uppermost mast member to support an aerial; a thrust bearing disposed between said axis member and said fourth mast member preventing downward movement of said axis member in said fourth mast member; and means in said base connected with said axis member for rotating the latter in said mast members.

5. An aerial mast comprising; a first tubular mast member; means fixedly and vertically supporting said first tubular mast member with its lower extremity elevated and in an open accessible position; a second tubular member telescopically slidable within said first tubular mast member; a first flange affixed to and projecting outwardly from adjacent the upper extremity of said second tubular

member; an axis pipe axially positioned within said tubular members and projecting above and below the latter; erecting means depending from adjacent the upper extremity of said axis pipe exteriorly of said tubular members; and a hooked member mounted on said erecting means and adapted to detachably engage said flange to draw said second tubular member upwardly in said first tubular member as said axis pipe is forced upwardly; a latch member, carried by said first mast member adapted to automatically snap into engagement with said second mast member when the latter has been drawn beyond a predetermined height to support the latter independently of said hook member, permitting the latter to swing out of engagement with said said flange; and means for withdrawing said latch member so as to permit lowering said second mast member when so desired.

6. An aerial mast as described in claim 5 having a third tubular member telescopically slidable within said second tubular member about said axis pipe; a second flange affixed to and projecting outwardly from adjacent the upper extremity of said axis pipe; and a second hooked member mounted on said erecting means and positioned to engage said second flange so as to lift said third tubular member with said second tubular member.

7. An aerial mast as described in claim 6 having a fourth tubular member telescopically slidable within said third

tubular member and about said axis pipe; and means carried by said axis pipe and engaging said fourth tubular member so as to lift said fourth tubular member with said second and third tubular members.

8. An aerial mast as described in claim 7 having latch members in said first, second and third tubular members adapted to engage said second, third and fourth tubular members respectively to support the latter in their elevated positions; and means connected with said latches and extending to a position adjacent the bottom of said first tubular member for withdrawing said latches from their engaged positions.

References Cited in the file of this patent

UNITED STATES PATENTS

685,385	Odette et al.	Oct. 29, 1901
1,070,167	Nitschke	Aug. 12, 1913
1,073,294	Liewert	Sept. 16, 1913
2,324,614	Dalton	July 20, 1943
2,331,558	McEwen et al.	Oct. 12, 1943
2,369,534	Cohen	Feb. 13, 1945
2,611,456	Bader	Sept. 23, 1952

FOREIGN PATENTS

233,035	Great Britain	Apr. 30, 1925