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A. T. MACE

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TELESCOPIC EXTENSIBLE ANTENNA

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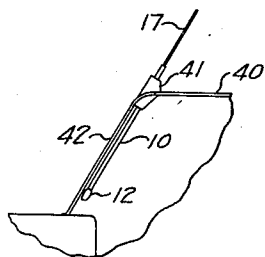


Fig. 6

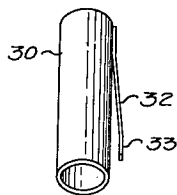


Fig. 5

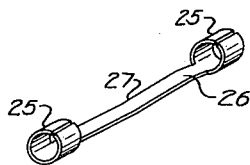


Fig. 3

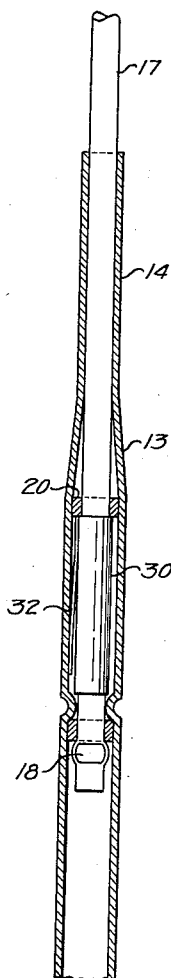


Fig. 4

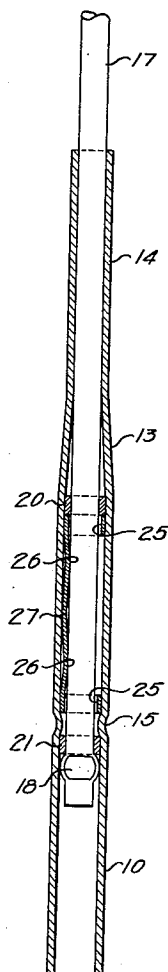


Fig. 2

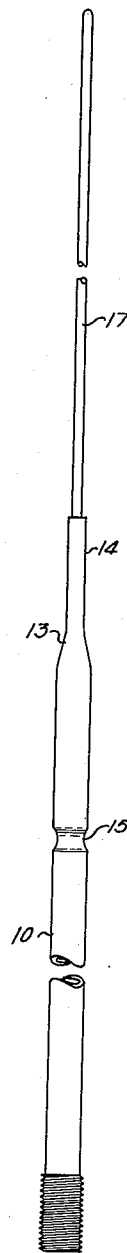


Fig. 1

INVENTOR.
ARTHUR T. MACE
BY *Ray, Colrick, Williams & Ray*
ATTORNEYS

UNITED STATES PATENT OFFICE

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TELESCOPIC EXTENSIBLE ANTENNA

Arthur T. Mace, Cleveland, Ohio, assignor to The Radiart Corporation, East Cleveland, Ohio, a corporation of Ohio

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6 Claims. (Cl. 287—58)

This invention relates, generally, to telescopically extensible antennae, and more specifically to a telescoping antenna comprising a single tube and a rod adapted to be slidingly engaged thereby for use in conjunction with vehicular radio reception and transmission sets.

Such antennae are subject to various road shocks and jars which frequently cause an extended antenna to collapse and rattle. Antennae of the type having a plurality of extensible tubes and a rod extensible from the innermost tube have heretofore been provided with means for maintaining the tubes in extended relation. Due, however, to the relatively small diameter of the innermost tube used in an antenna of the type to which this invention relates, difficulty has been experienced in providing means for maintaining the rod and tube in extended relation.

The primary object of this invention has been to provide an antenna of the type described which will maintain, as between the innermost rod and tube, any pre-selected degree of extension. Another object of this invention has been to provide means retained within the unsupported end of the tube for maintaining it and the rod in extended relation. A further object has been to provide an antenna of the type described, in which the tendency of the elements to rattle is eliminated. An additional object has been to provide an antenna of the type described in which the electrical contacts between the various elements are positive and eliminate electrical noise in the radio set.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims; the annexed drawing and the following description setting forth in detail certain structure embodying the invention, such disclosed means constituting, however, but one of various structural forms in which the principle of the invention may be used.

In said annexed drawing:

Fig. 1 is a fragmentary side view of an antenna embodying the preferred form of this invention;

Fig. 2 is a fragmentary cross-sectional view, taken on a plane passing through the vertical axis of Fig. 1;

Fig. 3 is a perspective view of a clamp which is part of this invention;

Fig. 4 is a view similar to Fig. 2, but illustrates a modification thereof;

Fig. 5 is a perspective view of the clamp shown in Fig. 4; and

Fig. 6 is a view showing an antenna constructed

in accordance with this invention attached to a vehicle.

Having reference now to the drawing in which like reference characters are employed to designate identical elements, and referring particularly to Figs. 1, 2 and 4, the antenna illustrated therein is seen to comprise an elongated metallic tube 10, one end 11 of which threadingly engages a finger knob 12. The other end of the tube has a gradual taper 13, terminating in a neck 14 of diminished diameter. An annular groove or indentation 15 is provided in the tube 10 to provide a constriction in the tube which cooperates with the constricted tapered portion 13 to retain a rod clamping means as hereafter set out. A metallic rod 17 is snugly received in the neck 14 and is slidable therein for extension and retraction as desired. The lower inner end of the rod is flattened, as at 18.

The rod is maintained in desired position in the tube by spring means positioned between the neck and annular groove. To this end two bushings 20 and 21 are maintained within the tube 10 adjacent and below the taper 13 and the groove 15, respectively, and to provide bearings or guides for the rod 17. The flattened portion 18 is of such size that it cannot pass through bushing 21.

Manufacture on an economical basis requires that the neck 14 and rod 17 be so designed that the gripping effect therebetween is not sufficient for resiliently maintaining them in a pre-selected extended position. My invention provides means for supplementing this gripping effect.

The preferred embodiment of such gripping means is shown in Figs. 2 and 3 and is seen to comprise a pair of collars 25 spaced apart and connected by an arm, as shown in Fig. 3. The two collars and the arm are preferably integral.

The inside diameters of the collars 25 are slightly larger than the external diameter of the rod 17 and are adapted to slide therealong. The arm 27 is waved so as to provide two crests 26 which bear against the rod 17 and a trough 27 which bears against the tube 10. This wave is sufficiently deep to cause the arm to be flexed or deformed when it is interposed between the tube 10 and the rod 17. The collars are locked in the tube 10 between the bushing 20 and the groove 15. The upper collar engages the bushing and the lower collar engages the groove. Thus the tube and rod are each gripped by the arm and the collars are cocked or tilted and also grip the rod.

A modification of the construction of Fig. 3 is shown in Fig. 4 and comprises a short tube 30 of

inner diameter which will permit it to slidably engage the rod 17. Depending and bent outwardly from the tube 30 and secured thereto, as by soldering or welding, is a resilient finger 32, a portion of which is bent inwardly, as at 33. The tube 30 is maintained in the desired position between the bushing 20 and the groove 15. The finger 32 rests against and is deflected inwardly by the inner wall of the tube 10 and causes the tube 30 to tilt or rock with respect to the rod 17. Thus the tube 30 and the rod become frictionally locked together, and since the tube 30 is locked with respect to the tube 10, the latter is locked with respect to the rod 17.

Since sleeve 25 and the tube 30 become tilted, the thickness thereof is such that the entire space between the rod 17 and the tube 10 is not occupied.

As is shown in Fig. 6, to attach an antenna embodying this invention to a vehicle, there is projecting on either side of the vehicle roof 40 a bushing 41, which snugly grips the tube 10 so that the operator of the vehicle may, by reaching toward the windshield 42, push up or pull down the finger knob 12, causing the tube 10 to slide up or down through the bushing 41; thus raising or lowering with it the rod 17 with respect to the roof of the vehicle.

The rod 17 and the tube 10 are normally so adjusted that, when the tube 10 is lowered from the vehicle interior, the upper tip of the rod 17 clears conventional constructions, such as garages, trees and the like.

It will be understood that the tube 30 or collars 25 could be locked axially with respect to the rod 17 instead of the tube 10. This reversal of mounting is accomplished by eliminating the groove 15, whereupon the flattened portion 18 will push the bushing 21 up and against the tube 30 or the collars 25. In such a construction a flattened portion similar to the one shown at 18 is provided immediately above the bushing 20 to cause the tube 30 or the collars 25 to be locked to the rod 17.

The antenna lead-in to the radio set is electrically connected to the aerial members at any suitable point.

The resiliency of the parts above described and shown in Figs. 3 and 5 tends to decrease rattling of the rod 17 against the tube 10 and make for more efficient and less noisy electrical contact so that radio signals are conducted from the top of the rod to the lead-in connection as though all the parts were one continuous electrical member.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the structure herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In a vehicular antenna, an outer tubular element, an element projecting therein and slidable with respect thereto, a collar freely fitting between said elements and adapted to be tilted with respect thereto, a resilient arm rigidly connected to said collar for engaging one of said elements and for tilting said collar whereby it engages the other of said elements to frictionally retain said parts together in preselected position,

said outer tubular element being adapted to be supported by a vehicle and connected to a lead in.

2. In a device of the character described, a tube, an element projecting therein and adapted for extension and retraction with respect thereto, a collar within said tube and freely fitting between said element and said tube an arm extending from and rigidly connected to said collar, said arm being adapted for engagement with said tube to force said collar against said element for frictionally locking said tube and said element with respect to each other.

3. In a telescopic extensible antenna, a tube terminating in a neck, an elongated member extending into said tube beyond said neck, a locking element interposed between said tube and said member and adapted for frictionally engaging said tube and said member to retain the same in preselected position with respect to each other, said element comprising at least one sleeve-shaped member adjacent said neck and adapted to fit around said elongated member and a resilient portion connected to said sleeve-shaped member and engaging said tube, said tube having an indentation adapted to engage that end of said locking element which is remote from said neck whereby movement of said sleeve-shaped member axially with respect to said tube is limited.

4. In a device of the character described a tube having two spaced and adjacent annular portions of reduced inner diameter, an element projecting into both of said portions and extensible and retractable with respect thereto, and a spring having sleeve-shaped end portions and a middle portion interconnecting the end portions, said spring being located between both of said tube portions and having the sleeve-shaped ends abutting the same while said middle portion is in engagement with said tube and said element for restraining said extension and retraction.

5. In a device of the character described, a tube one end of which is open and has a taper that terminates in a neck, the portion of said tube adjacent said taper being provided with a constriction, an element projecting into said tube through said neck and beyond said constriction, and a spring adapted to engage said tube and said element for maintaining them in preselected position with respect to each other, said spring having sleeves formed at the ends thereof, said sleeves being adapted for freely fitting between said tube and said element, said spring having a middle portion which is waved and flexed between said tube and said element whereby said sleeves tilt and frictionally engage said element.

6. In a device of the character described, a tube one end of which is open and has a taper that terminates in a neck, the portion of said tube adjacent said taper being provided with a constriction, an element projecting into said tube through said neck and beyond said constriction, and a spring adapted to engage said tube and said element for maintaining them in preselected position with respect to each other, said spring having sleeve-shaped end portions, said taper and said constriction serving to abut said end portions for maintaining said spring between said taper and said constriction.

ARTHUR T. MACE.