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KOZO YOKOYAMA
TELESCOPING ANTENNA WHICH COLLAPSES THROUGH
CENTRALLY MOUNTED LOADING COIL
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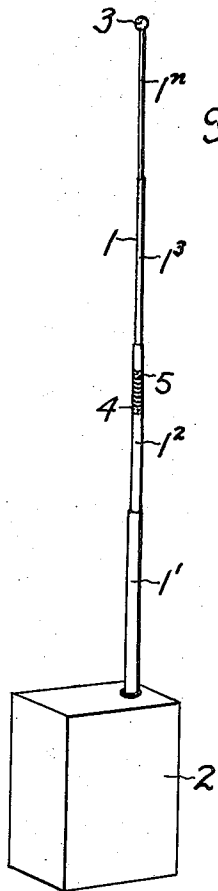


Fig. 1.

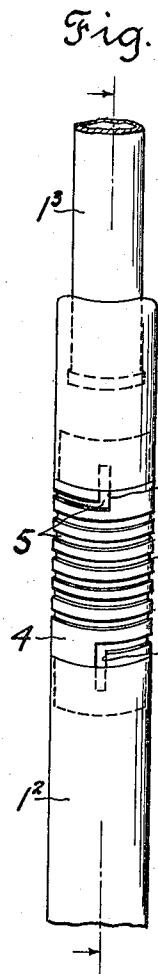


Fig. 3.

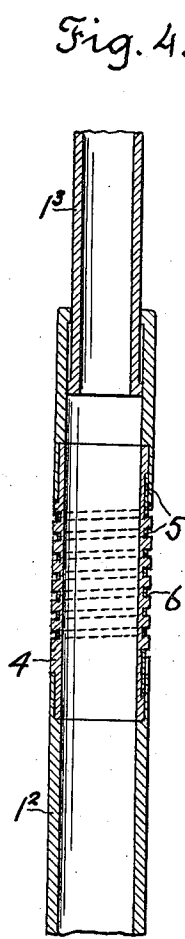


Fig. 4.

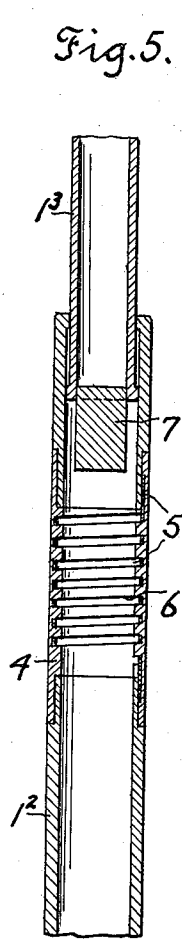


Fig. 5.

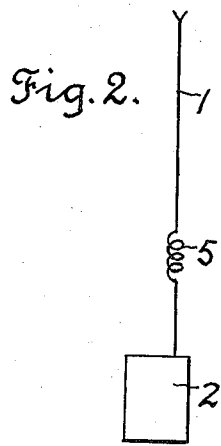


Fig. 2.

INVENTOR.
Kozo Yokoyama
BY
Wunderoth, Lind & Ponack,
Attys.

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TELESCOPING ANTENNA WHICH COLLAPSES THROUGH CENTRALLY MOUNTED LOADING COIL

Kozo Yokoyama, Tokyo, Japan, assignor to Torio Company, Limited, Tokyo, Japan, a limited-liability company of Japan

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4 Claims. (Cl. 343-750)

The present invention relates to telescoping antennas which are constructed of a plurality of tubular sections of electric conductor in a telescoping arrangement, in which the individual sections fit inside each other.

It is known that the effective length of an antenna can be increased by placing a loading coil as a lumped inductance in series with the antenna, and that, in telescoping antennas, the loading coil is provided at the base of the antenna. Hitherto, in common telescoping antennas, the loading coil can not be provided at the intermediate portion of the antenna, because the loading coil is of larger diameter than any other tubular section of the antenna, thus preventing the collapse of the antenna.

The principal object of this invention is to obtain a telescoping antenna comprising a plurality of tubular sections of electric conductor which are in a telescoping arrangement, one of said tubular sections having an insulator part connected with its conductor parts, and a loading coil which is buried in said insulator part, both ends of said loading coil being individually connected with said conductor parts. Thus, according to my invention, a loading coil is provided at the intermediate portion of a telescoping antenna, and consequently, the telescoping antenna can be efficiently used with a transmitting and/or receiving equipment.

Another object of this invention is to obtain a telescoping antenna, in which a loading coil is provided at the intermediate portion of the antenna and a magnetic core is provided within another antenna section near said portion to engage with said loading coil. Such telescoping antenna can be favorably used with an all-band receiving equipment.

The more specific objects and advantages will become apparent from a consideration of the following description.

In the accompanying drawing:

FIG. 1 is a perspective view of a telescoping antenna according to my invention, when in use;

FIG. 2 is a connection diagram of the above;

FIG. 3 is an enlarged perspective view of the principal part of the above;

FIG. 4 is a sectional elevation of said principal part taken along the section line of FIG. 3; and

FIG. 5 is a similar sectional elevation of another embodiment of the invention.

Like characters of reference show corresponding parts throughout several views.

Referring to FIG. 1, 1 denotes a telescoping antenna according to this invention, which is adapted to mount on a transmitting and/or receiving equipment 2 at the base of the antenna as ordinary telescoping antennas.

The telescoping antenna 1 is constructed of two or more tubular sections 1¹, 1², . . . , 1ⁿ of electric conductor such as metal, for example steel, in a telescoping arrangement, in which the individual sections fit inside each other as ordinary telescoping antennas. The top section 1ⁿ has a stop head 3 at its top end.

One of said tubular sections, for example 1² is provided with an insulator part 4, which is formed as a tube of the same cross section as the conductor parts of said antenna section 1² and made of any suitable insulating material such as synthetic resin, for example vinyl chloride, said

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insulator part being securedly fixed between the conductor parts of the section 1² as shown in FIGS. 3 and 4, and a loading coil 5 is provided by burying it in the insulator part 4.

In the embodiment as shown in FIGS. 3 and 4, the insulator tube 4 has a helical groove 6 at its outside, in which an electric conductor 5 such as a bare wire or an insulated wire is buried, and both ends of said conductor are individually connected with the conductor parts of the antenna section 1² through vertical ends 6' of the groove 6, thus constituting the loading coil of the antenna 1 as shown in FIG. 2.

In another embodiment as shown in FIG. 5, a helical groove 6 is provided at the inside of the insulator tube 4 and an electric conductor 5 as the loading coil is buried in said groove. According to this embodiment, the loading coil 5 is provided inside the insulator tube 4, and consequently, is free from external damages and is of larger Q, which is based on an air core only, than the loading coil in the aforesaid embodiment.

When extended as shown in FIG. 1, the telescoping antenna 1 having the loading coil 5 at the intermediate portion of the antenna can be efficiently used with a transmitting and/or receiving equipment, and when not in use, said extended antenna can be collapsed by pushing each section into the next by means of the special construction according to the invention in spite of the provision of the loading coil at the intermediate portion of the antenna. In this way the antenna is at its shortest length, and portability is increased.

Moreover, the telescoping antenna 1 can be favorably used with an all-band receiving equipment by providing a magnetic core 7 at the bottom end of the antenna section 1³ as shown in FIG. 5, which magnetic core may be engaged with the loading coil 5 by pushing the antenna section 1³ into the antenna section 1², thereby gradually increasing the induction and Q of said loading coil.

Without further description it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art, and it will of course be understood that changes in the form, proportion and minor details of construction may be resorted to, without departing from the spirit of the invention or the scope of the appended claims.

What I claim is:

1. A telescoping antenna comprising a plurality of tubular sections of electric conductor and each successive section being telescopically slidable within the preceding section, one of said tubular sections having two spaced conductor parts, and a hollow insulator part having the same outside diameter as said one tubular section connected between conductor parts, and a loading coil buried in said insulator part, both ends of said loading coil being individually connected with said conductor parts.

2. A telescoping antenna comprising a plurality of tubular sections of electric conductor and each successive section being telescopically slidable within the preceding section, one of said tubular sections having two spaced conductor parts, and a hollow insulator part having the same outside diameter as said one tubular section connected between conductor parts, said insulator part having a helical groove in the outside surface thereof, and a loading coil which is buried in said helical groove, both ends of said loading coil being individually connected with said conductor parts.

3. A telescoping antenna comprising a plurality of tubular sections of electric conductor and each successive section being telescopically slidable within the preceding section, one of said tubular sections having two spaced conductor parts, and a hollow insulator part having the same outside diameter as said one tubular section con-

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nected between conductor parts, said insulator part having a helical groove in the inside surface thereof, and a loading coil which is buried in said helical groove, both ends of said loading coil being individually connected with said conductor parts.

4. A telescoping antenna comprising a plurality of tubular sections of electric conductor and each successive section being telescopingly slidable within the preceding section, one of said tubular sections having two spaced conductor parts, and a hollow insulator part having the same outside diameter as said one tubular section connected between conductor parts, a loading coil which is buried in said insulator part, both ends of said loading

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coil being individually connected with said conductor parts, and a high permeability magnetic core mounted on the end of the next successive tubular section and movable within said loading coil for changing the inductance thereof.

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