Nov. 19, 1940. W. H. BOUGHTER 2,222,527

RADIO ANTENNA

Filed Feb. 5, 1938

Fig. 1.

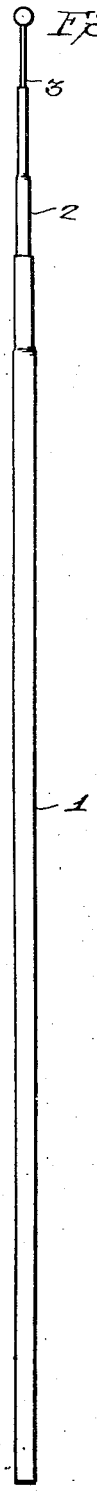



Fig. 2

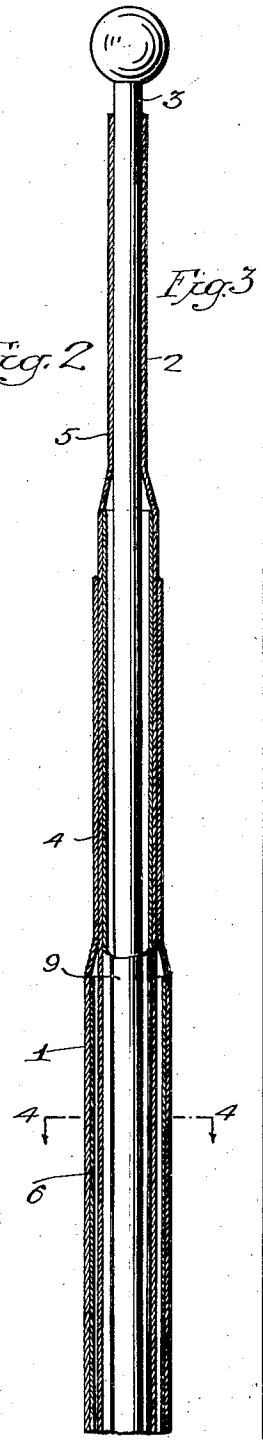



Fig. 3

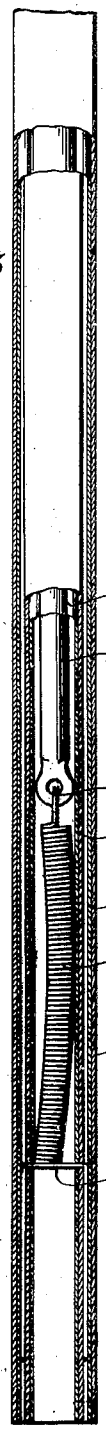



Fig. 4

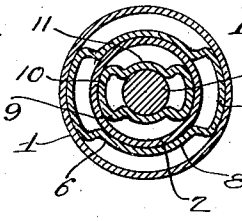
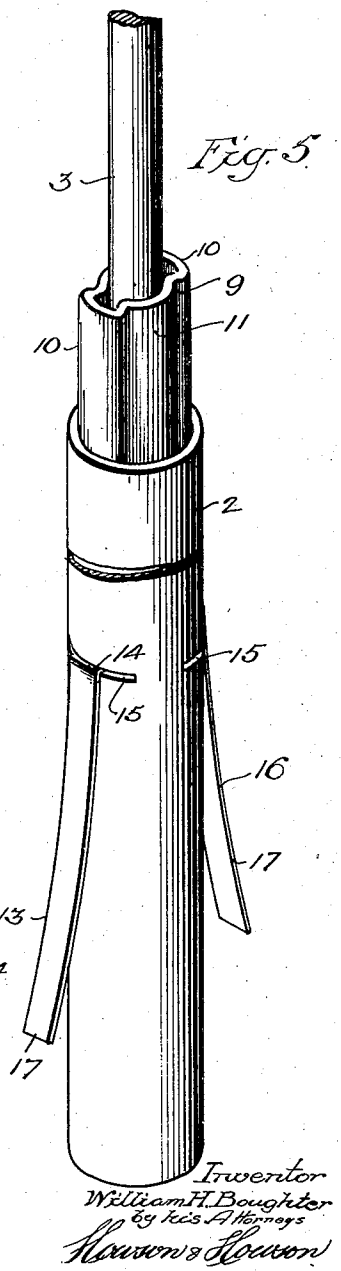



Fig. 5




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# UNITED STATES PATENT OFFICE

2,222,527

## RADIO ANTENNA

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Application February 5, 1938, Serial No. 188,968

1 Claim. (Cl. 287—58)

This invention relates to new and useful improvements in radio antennae, and more particularly to a novel telescopically adjustable radio antenna for use on automobiles and other vehicles in conjunction with radio receiving sets.

Radio antennae of the type described are currently in use, but as heretofore constructed have been found generally objectionable for the reason that the several telescoped sections thereof become loosened with respect to one another after short periods of use, due to vibration of the vehicle, with the result that they rattle and will not always remain in the positions to which telescopically adjusted.

With the foregoing observations in mind, the principal object of the present invention is to provide a telescopically adjustable radio antenna of the character set forth having novel means for frictionally holding the several telescoping sections thereof in firm relation to each other in all positions to which adjusted, thus eliminating rattles therein and insuring said sections remaining in the position to which adjusted.

These and other objects of the invention, as well as the features and details of construction thereof, are hereinafter fully set forth and shown in the accompanying drawing, in which:

Figure 1 is a view in elevation of a telescopically adjustable radio antenna embodying the present invention.

Figure 2 is an enlarged view in section vertically through an upper part of said antenna.

Figure 3 is an enlarged view partially in section vertically through the other or lower portion of the antenna.

Figure 4 is an enlarged view in section taken on line 4—4, Figure 2; and

Figure 5 is an enlarged fragmentary view in perspective showing certain features and details of the construction and arrangement of the uppermost and intermediate telescoping sections of the antenna.

Referring now particularly to the drawing, a radio antenna made according to the present invention comprises a main or lower section 1 with which is telescopically associated one or more sections, two such telescopically adjustable sections 2 and 3 respectively being illustrated in the present instance. The sections 1 and 2 are, of course, hollow to provide the telescopic structure and, as shown section 2 telescopes within the main section 1, while section 3 telescopes within said section 2.

The section 1 is provided with a reduced neck portion 4 at its upper end arranged to fit relatively snug about the smaller diameter section 2 which is in turn provided with a reduced neck portion 5 at its upper end arranged to fit relatively snug about the smaller diameter section 3 which is preferably of solid construction to render it substantially rigid. These reduced neck portions 4 and 5 tend to prevent rain water and other matter from passing downwardly between the several sections, and in addition function, as hereinafter set forth, to prevent said sections from being pulled entirely apart.

For the purpose of providing a firm friction support for and between sections 1 and 2 of the antenna, regardless of their telescopic relation, a relatively resilient tubular lining 6 is fitted within said section 1, and as shown in the drawing, this lining 6 extends substantially throughout the length of the section and comprises a portion 7 of such external diameter as will frictionally engage the inner surface of section 1 and a portion 8 of such internal diameter as will frictionally embrace the external surface of the adjacent section 2 which telescopes therein. These portions 7 and 8 of different diameters extend throughout the length of the tubular lining 6 and exert a moderate friction grip upon both section 1 and section 2, thus eliminating play therebetween and preventing rattling thereof while insuring said sections remaining in the relative position to which they may be telescopically adjusted.

In like manner and for the same purposes, a similar tubular lining 9 is fitted within section 2 of the antenna, and, as in the case of the lining 6, lining 9 includes a portion 11 of such external diameter as will frictionally grip or embrace the external surface of the upper section 3 which telescopes therein. To simplify the manufacture by elimination of close tolerances, the inner diameter of each outer section, such as 1 and 2, is made somewhat larger than is needed to accommodate the outer diameter of each inner section such as 2 and 3. From the foregoing, it will be observed that the several sections of a telescopically adjustable radio antenna made in accordance with the foregoing description will be firmly supported relative to each other at all times and will not rattle, the several sections also being afforded sufficient support to insure their remaining in the positions to which they may from time to time be adjusted.

It is absolutely essential that a good electrical connection for radio frequency currents obtains at all times and for this reason several contacts between the several sections of the antenna are employed. One electrical connection between

the upper section 3 is provided by an arcuately resilient spring 12 which is connected to a lug 13 provided at the lower end of said section 3, and this spring 12 normally resides within the tubular lining 9 of section 2. The normal radius curvature of the axis of the spring 12 is relatively small and when it is positioned within the tubular lining 9, it tends to flex or straighten out, with the result that a portion of said spring 12 is at all times pressed firmly against the inner surface of said lining 9.

A connection between section 2 and section 1 of the antenna is provided by means of an inverted U-shaped strip 16 of resilient metal which, as shown in Figures 3 and 5, has its central portion 14 extending through slots 15 formed in said section 2 adacent the lower end thereof, and has its depending diverging resilient arm portions 17 disposed at diametrically opposite sides of section 2 for pressure contact with the inner surface of the tubular lining 6 of section 1.

In addition to the previously mentioned functions, the lug 13, to which the spring 12 is connected, and the resilient strip 16, constitute stops which function in cooperation with the reduced neck portions 4 and 5 respectively of sections 1 and 2 to prevent the several sections from being pulled entirely apart. Furthermore the liners 6 and 9 provide direct contact between their respective sections along the overlapping portions thereof and thus assist in providing electrical connections between the several sections. This is particularly advantageous in view of the use of such antennae on automobiles and the like where it has been found that a single contact between the sections sometimes will open intermittently and by providing several connections between the sections as in the present case, it is extremely unlikely that several such contacts, any of which is sufficient, will open at the same time, thus insuring electrical connection between the several sections at all times.

The particular construction, form or shape of the tubular linings 6 and 9 is not confined to the particular construction or cross section shape herein illustrated and described and said linings may be of any desired or suitable form so long as they frictionally engage and support adjacent telescoping sections at one or more points along the length thereof, and in this and other respects, it is not intended to limit the invention to the particular construction and arrangement disclosed, but that changes and modifications may be embodied and incorporated therein within the scope of the annexed claim.

I claim:

A radio antenna of the character described comprising a plurality of sections telescopically adjustable one within another and being spaced from each other along a portion of their length, and a tubular lining frictionally secured within one section into which an adjacent section telescopes and arranged to slidably receive the latter, said lining being substantially as long as the spaced and overlapping portions of said sections when in closed position and having diametrically opposed axially extending portions of predetermined diameter arranged to frictionally engage the section in which disposed and diametrically opposed axially extending other portions of less diameter arranged to frictionally engage the adjacent inwardly telescoping section for the purpose of eliminating play between adjacent sections and insuring said sections remaining in the position to which adjusted.

WILLIAM H. BOUGHTER.