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ANTENNA TUNING DEVICE FOR AUTOMOBILE RADIOS

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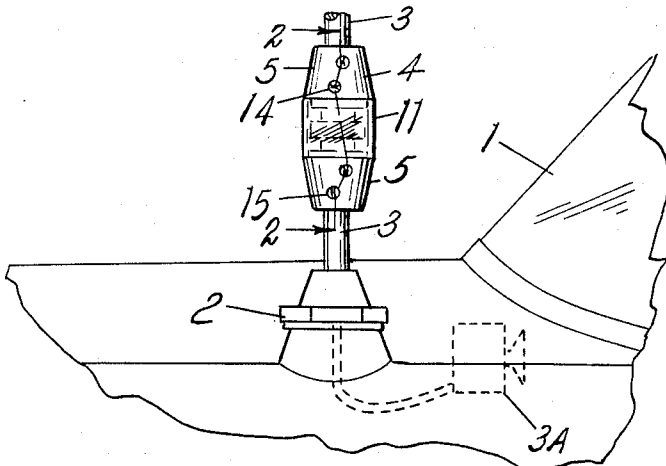


Fig. 1.

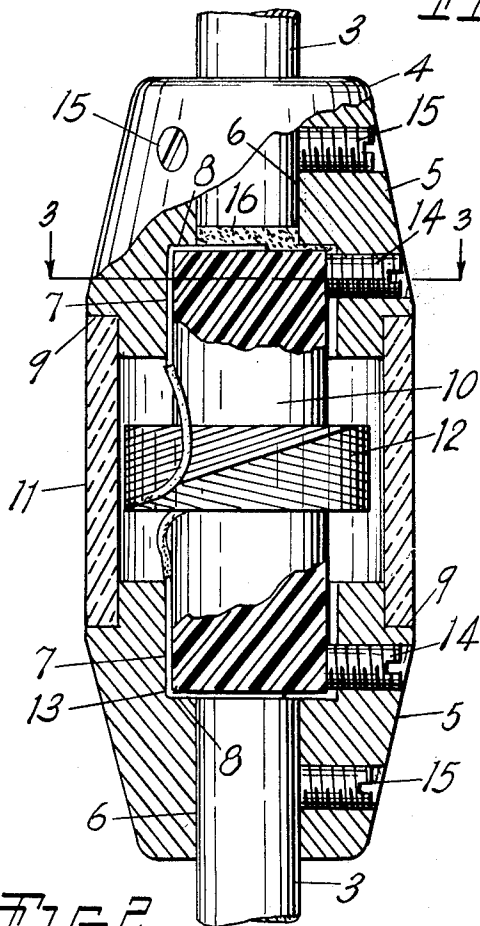


Fig. 2.

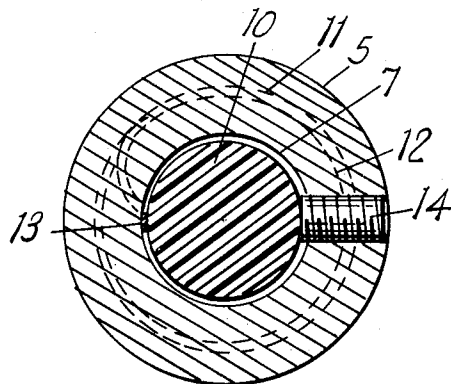


Fig. 3.

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ANTENNA TUNING DEVICE FOR AUTOMOBILE RADIOS

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5 Claims. (Cl. 343—749)

This invention relates to antenna tuning device for automobile radios.

The principal objects of this invention are:

First, to provide an accessory attachable to the existing antenna rod of an automotive vehicle to improve the reception of the radio.

Second, to provide an inexpensive coil mounting for creating broad high gain response characteristics throughout the standard broadcast band in an automobile radio antenna.

Third, to provide novel means for connecting an impedance coil in the external portion of an automobile antenna rod.

Other objects and advantages of the invention will be apparent from a consideration of the following description and claims. The drawings of which there is one sheet, illustrate a highly practical form of the invention.

Fig. 1 is a fragmentary side elevational view of an automobile and automobile radio antenna with the tuning device of the present invention mounted in the antenna.

Fig. 2 is an enlarged longitudinal cross sectional view through the tuning coil mount and the adjacent portions of the antenna taken along the plane of the line 2—2 in Fig. 1.

Fig. 3 is a transverse cross sectional view taken along the plane of the line 3—3 in Fig. 2.

It has been known for some time that the best reception of radio signals in so far as the receiving antenna is concerned is obtained with a relatively long antenna. In receiving standard broadcast band frequencies an antenna length of 100 feet or more is desirable. It has also been demonstrated that a coil of the proper impedance connected in series with an antenna will lengthen the effective length of the antenna in so far as reception or pick-up properties of the antenna are concerned. Radio antennas for automobiles are limited in length as a practical matter to between one and three feet in length and these antennas are commonly formed of relatively rigid rods of either solid or telescoping construction. The present invention provides means for conveniently and inexpensively applying an impedance coil to the rod antenna of an automobile to extend the effective length of the antenna.

The drawings illustrate a portion of an automobile 1 having an antenna mount 2 positioned on the fender or other portion of the body. The antenna rod 3 has a coil mount 4 connected therein as will now be described in greater detail. The radio to which the antenna is connected is indicated conventionally at 3A.

The coil mount 4 consists of upper and lower body members 5 which may be of identical shape and construction. The body members 5 are metallic and electrically conducting and have aligned axial bores 6 formed in their outer ends. The inner ends of the body members are counterbored as at 7 to provide axially inwardly facing shoulders 8 and the peripheries of the body members are notched or shouldered as at 9. A core rod 10 of insulating material has its ends received in the counterbores 7

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of the body members while a cylindrical sleeve 11 of transparent insulating plastic material has its ends seated against the shoulders 9 to hold the body members in spaced electrically insulated relation.

An impedance coil 12 having its turns insulated from each other is wound around the mid-portion of the core rod 10 within the sleeve 11. The ends of the coil are extended into the counterbores 7 and over the ends of the core rod as at 13. Set screws 14 threaded into the sides of the body members clamp the ends of the core rod against the opposite sides of the counterbores and in so doing clamp the bared ends of the coil into good electric contact with the metallic members.

The axial bores 6 in the body members are sized to receive the more common size of antenna rods and in installing the coil mount in an automobile antenna, the antenna rod is cut or sawed in two at a short distance above the rod mount 2. The stud or base portion 3 of the antenna rod is inserted into the bore in the lower body member and the upper severed portion 3A of the antenna rod is inserted into the bore in the upper body member. Set screws 15 in the sides of the body members clamp the ends of the antenna rod into the body members. Desirably a plastic sealing material is introduced into the upper bore 7 as at 16 to prevent water from leaking along the upper portion of the antenna into the upper body member.

Continuous electric contact is obtained between the portions of the antenna rod through the metallic members and the bared ends of the coil and the core rod 10 and sleeve 11 form the necessary mechanical support for the upper portion of the antenna rod. In practice the coil 12 has an impedance of about 25 ohms and the coil is designed to have as high a power factor as possible that tunes the antenna rod to resonance at 700 kilocycles coupled with the normal tuning of automobile radios and antenna rods. The addition of the coil provides a resultant broad high gain response over the entire standard broadcast band.

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

1. In combination with a motor vehicle having a radio receiver mounted therein and a stub antenna section mounted externally of the vehicle and connected to the receiver, an antenna system comprising a housing having identical upper and lower metallic body portions having opposed shouldered ends disposed inwardly of the housing, a cylinder of transparent insulating plastic material seated between said shouldered ends and holding said body members in spaced relation, said body members having coaxial bores formed therethrough and enlarged counterbores at the inner ends of body members, an insulating core rod extending between said body members and having its ends received in said counterbores, an impedance coil wound around said core within said cylinder and having bared ends extending into said counterbores and around the ends of said core, set screws in the sides of said body members opposite said bared wires and acting to press said core and said bared ends against the insides of said counterbores, the stub antenna section of said vehicle being received in the outer bore of said lower body member, and an antenna mast section having its lower end received and supported in the outer bore of said upper body member, and other set screws in the sides of said body members clamping said mast sections in said body members, said coil having an impedance of a value sufficient to resonate said antenna sections in the standards broadcast frequency band.

2. In combination with a motor vehicle having a radio receiver mounted therein and a stub antenna section mounted externally of the vehicle and connected to the receiver, an antenna system comprising a housing having

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identical upper and lower metallic body portions, a cylinder of insulating plastic material seated between and holding said body members in spaced relation, said body members having coaxial bores formed therethrough and enlarged counterbores at the inner ends of body members relative to the housing, an insulating core rod extending between said body members and having its ends received in said counterbores, an impedance coil wound around said core within said cylinder and having bared ends extending into said counterbores, set screws in the sides of said body members opposite said bared wires and acting to press said core and said bared ends against the insides of said counterbores, the stub antenna section of said vehicle being received in the outer bore of said lower body member, and an antenna mast section having its lower end received and supported in the outer bore of said upper body member, and other set screws in the sides of said body members clamping said mast sections in said body members, said coil having an impedance of a value sufficient to resonate said antenna sections in the standard broadcast frequency band.

3. In combination with a motor vehicle having a radio receiver mounted therein and a stub antenna section mounted externally of the vehicle and connected to the receiver, an antenna system comprising a housing having identical upper and lower metallic body portions, a cylinder of insulating material seated between and holding said body members in spaced relation, said body members having coaxial bores formed therethrough, an insulating core rod extending between said body members and having its ends received in said bores, an impedance coil wound around said core within said cylinder and having bared ends extending into said bores, set screws in the sides of said body members opposite said bared wires and acting to press said core and said bared ends against the insides of said bores, the stub antenna section of said vehicle being received in the outer end of the bore of said lower body member relative to said housing, and an antenna mast section having its lower end received and supported in the outer end of the bore of said upper body member relative to said housing, and other set screws in the sides of said body members clamping said mast sections in said body members, said coil having an impedance of a value sufficient to resonate said antenna sections in the standard broadcast frequency band.

4. In combination with a motor vehicle having a radio receiver mounted therein and a stub antenna section mounted externally of the vehicle and connected to the receiver, an antenna system comprising a housing having

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identical upper and lower metallic body portions, a cylinder of insulating material enclosing the space between said body members, said body members having coaxial bores formed therethrough, an insulating core rod extending between said body members and having its ends received in said bores, an impedance coil wound around said core within said cylinder and having bared ends extending into said bores, set screws in the sides of said body members opposite said bared wires and acting to press said core and said bared ends against the insides of said bores, the stub antenna section of said vehicle being received in the outer end of the bore of said lower body member relative to said housing, and an antenna mast section having its lower end received and supported in the outer end of the bore of said upper body member relative to said housing, and other set screws in the sides of said body members clamping said mast sections in said body members, said coil having an impedance of a value sufficient to resonate said antenna sections in the standard broadcast frequency band.

5. An antenna tuning device for receiving sets of automotive vehicles having antenna rods comprising spaced metallic and identical body members having bores formed in the outer ends thereof and adapted to receive the ends of an antenna rod when said rod is cut in two, an insulating core rod extending between said body members and having its ends received in recesses formed in the body members, a coil wound around said core between members and having bared ends extending into contact with said members and clamped against the members by the ends of said core, set screws in the sides of said members extending into said recesses and clamping the ends of the core against the members, other set screws in said body members extending into said bores and adapted to clamp the severed ends of said antenna rod in said body members, and an insulating sleeve extending between said members and around said coil, said sleeve being in axial abutting engagement with said members, said coil having an impedance of a value sufficient to tune a three foot antenna rod to resonance in the standard broadcast band.

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