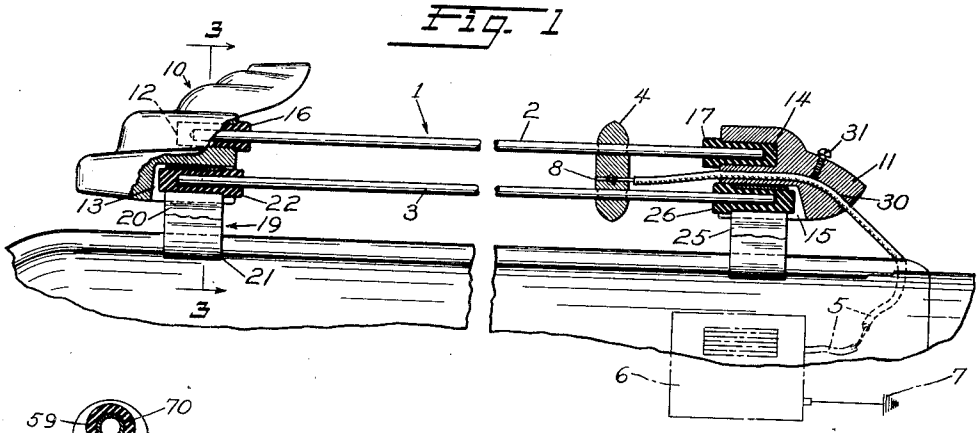
Jan. 23, 1940. J. D. BORDER 2,188,143

ANTENNA DEVICE

Filed May 17, 1937

Fig. 1



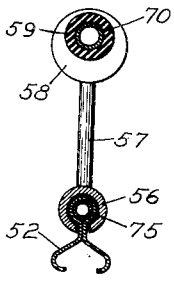


Fig. 4

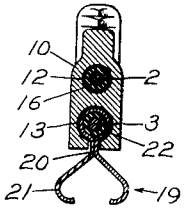


Fig. 3

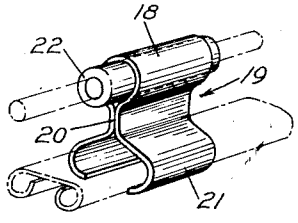


Fig. 2

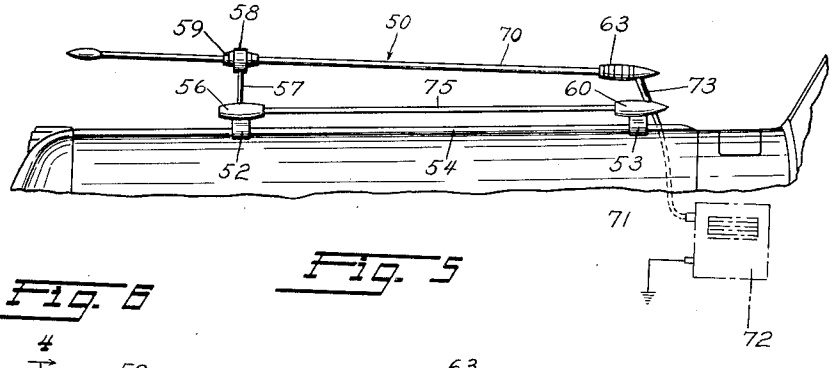
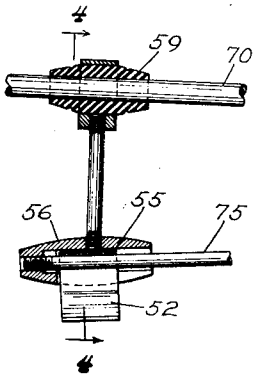


Fig. 5

Fig. 6



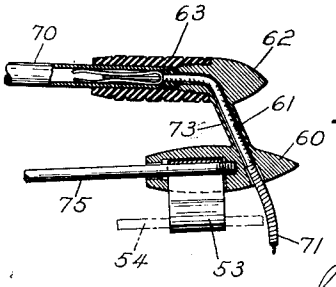


Fig. 7

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2,188,143

ANTENNA DEVICE

James D. Border, Detroit, Mich., assignor to Associated Spring Corporation, Bristol, Conn., a corporation of Delaware

Application May 17, 1937, Serial No. 143,175

1 Claim. (Cl. 250—33)

This invention relates broadly to radio receiving apparatus and, more particularly, to antenna devices adapted to intercept radio transmissions and supply the intercepted radiations to a receiving device.

It is a primary object of this invention to provide an antenna device which may be employed on automobiles or similar vehicles and which, when so employed, will not be subject to the disadvantages and operating deficiencies found in antenna arrangements heretofore employed on such vehicles.

An object of the invention is to provide an antenna array which may be mounted on an automotive or other vehicle in such a position that it will not be subject to the shielding of portions of the body of the vehicle, thereby removing one of the deficiencies of automobile antenna devices as heretofore employed and arranged.

A further object of the invention is to provide an antenna device, which is provided with means whereby the antenna may be easily and quickly attached to or disconnected from any suitable part of an automotive or other vehicle.

Other objects and features of novelty will be apparent from the following description and the annexed drawing, it being expressly understood, however, that the invention is not limited in any way by such description and drawing, or otherwise than by the appended claim.

Referring to the drawing, in which similar reference numerals refer to like parts;

Fig. 1 is an elevation view, partly broken away, showing the mounting of an antenna on an automobile, according to the invention;

Fig. 2 is a perspective view of a device for attaching the antenna to a support therefor;

Fig. 3 is a sectional view, taken on the line 3—3 of Fig. 1;

Fig. 4 is a sectional view, taken on the line 4—4 of Fig. 6;

Fig. 5 is an elevational view showing the mounting of a second form of antenna on an automobile, according to the invention;

Fig. 6 is a partial sectional view showing the front supporting member illustrated in Fig. 5, and

Fig. 7 is a partial sectional view showing the rear supporting member illustrated in Fig. 5.

By the present invention it is intended to provide an antenna device which may be mounted on an automotive vehicle or on any other structure, which will provide improved reception of radio transmissions, which may also be so designed as to provide an ornamental addition to the vehicle or other structure, and which will be provided with attaching means whereby it may be easily attached to or removed from the vehicle of other structure.

In the embodiment of the invention which is disclosed in Figs. 1 to 4 of the drawing, there is provided an antenna array denoted generally by numeral 1 and which comprises the two parallel antenna wires or rods 2, 3. These wires or rods are adapted to intercept radio broadcast transmissions and, to better effect this end, are electrically connected together and to a radio receiving device 6. In the embodiment disclosed, the two antenna members are electrically connected by means of the device 4 which is slidably received on the antenna wires or rods and which may be locked in position thereon by any suitable means. A lead wire 5 extends from the connecting device 4 to the antenna lead terminal of the radio receiver 6, and this lead wire may have its one end received in an opening 8 in the connecting member 4 and may be firmly attached therein by any suitable means such as a set-screw. The receiver 6 may be grounded at 7 and includes receiving, detecting and amplifying means, together with any loudspeaker or other translating device.

Means are provided for mounting the antenna rods or wires 2, 3 in such a manner as to cause them to maintain a spaced, relatively rigid and fixed arrangement, whereby the antenna array may be handled or transported as a unit. Such means comprise the head pieces 10 and 11 which are, respectively, positioned at the front and rear of the antenna array. Formed in each of the head pieces 10 and 11 are two vertically spaced openings, those in the head piece 10 being designated as openings 12 and 13, while those in head piece 11 are designated as openings 14 and 15. The upper openings 12 and 14 are similar in shape and arrangement and are of cylindrical, elongated conformation in order to receive elongated, cylindrical bushing members 16 and 17. These bushing members are preferably formed of hard rubber, Bakelite or some other electrically insulating material, and are each provided with a longitudinal internal opening within which an end of the antenna member 2 may be tightly received. It will be seen that when the bushing members 16, 17 are tightly disposed within the openings in the head pieces, and the ends of the antenna member 2 tightly disposed within the openings in the insulating members, the head pieces and the antenna member 2 will form a

unitary assembly the parts of which are insulated from each other.

The lower openings 13 and 15 in the two head pieces are similar to each other in form, but differ somewhat from the upper openings 12, 14. Each of the lower openings comprises an elongated cylindrical opening which connects with a longitudinal opening in the lower wall of the head, which opening is of considerably less diameter than the cylindrical opening above it. The cylindrical openings 13, 15 are each of such diameter as to tightly receive the cylindrical head 18 of a spring clip device denoted generally as 19 and illustrated clearly in Figs. 3 and 4. This spring clip is preferably formed from a single piece of spring metal and comprises the cylindrical head 18, below which the sides of the clip are brought together, as at 20, and below which constricted portion the sides are flared outwardly and then inwardly to provide a clip portion, as at 21. The upper, cylindrical portion 18 is of sufficient diameter to tightly receive therein an insulating bushing member 22 which is preferably similar in form and construction to the bushings 16, 17 which are disposed in the upper openings in the head members.

The upper cylindrical portion of the clip member will be received within the upper cylindrical portion of the opening 13 in the front head member 10, while the intermediate, constricted portion 20 of the clip member will extend through the narrow opening in the bottom of the head member. The lower, resilient portion 21 of the clip member will extend below the lower face of the head member for a purpose which will be fully explained hereinafter. The insulating bushing 22 will be tightly held within the opening 13 in the head member by reason of its engagement within the cylindrical portion 18 of the clip member, and by reason of the engagement of the head of the clip member within the opening 13 in the head. A similar construction and arrangement is provided in the rear head member, wherein the clip 25 is attached within the opening 15 and supports the insulating bushing member 26. The ends of the lower antenna member 3 are disposed within the aligned openings in the bushing members 22 and 26 and are rigidly and firmly supported in position therein, thereby providing a rigid, unitary assembly comprising the two antenna members and the two head members.

The rear head member 11 may be provided with an opening 30 extending therethrough, through which the antenna lead wire 5 may be passed. A set-screw 31 may be threaded into the rear head member in such a position that the end thereof will contact the wire 5 and rigidly hold the same in position in the opening 30. Obviously, the conduit 30 may be provided in the front head member if desired, in which case the connecting member 4 will preferably be positioned adjacent the front head member.

A second form which the invention may take is illustrated in Figs. 5 to 8, and in this modified form I have employed only a single antenna member and have removed this farther from the engine hood, this in order to reduce the capacity effects between the steel engine hood and the antenna.

Referring to the figures of the drawings in which this modified form is disclosed, it will be seen that I have provided an antenna rod or wire 50 which is preferably supported in substantially horizontal position above the engine hood 51 of an automotive or other vehicle. In order to support the antenna rod or wire in this position, I provide spaced attaching clips 52 and 53 which are preferably connected to spaced portions of the usual engine hood hinge strip 54 or to any other ornamental or supporting means arranged on the engine hood. These attaching clips are preferably formed in the same manner as those illustrated in Figs. 3 and 4 of the drawings.

The upper, cylindrical head 55 of the front spring clip 52 is received within an elongated cylindrical opening formed in a spacing and supporting member 56 which may have elongated, streamlined contours as clearly illustrated in the drawings. Screw-threaded into the upper portion of the supporting device 56 and extending vertically therefrom is a short rod member 57, the upper end of which is screw-threaded into the lower portion of a ring device 58 which has an aperture extending therethrough. An insulating bushing 59 is arranged within the aperture in the ring device and is provided with an aperture extending therethrough in a direction parallel to the longitudinal extent of the engine hood.

The rear spring clip device 53 is disposed in the manner referred to hereinbefore, and the upper, cylindrical portion of this clip is received within a cylindrical opening formed in a rear supporting device 60 which may be formed with streamlined contours, as illustrated. Extending from the upper portion of the supporting device 60 and preferably so arranged as to be slightly inclined forwardly, is a rod or column 61, to the upper end of which is attached a heading member 62. Rigidly connected to the heading member 62 and extending forwardly therefrom is an elongated cylindrical insulating device 63, the same having a cylindrical opening extending longitudinally therethrough and being aligned with the opening in the bushing 59 in the front supporting device.

The aligned openings in the front and rear supporting bushings 59 and 63 are adapted to receive and tightly hold and support the antenna rod or wire 50, which preferably extends longitudinally of the engine hood and is supported at such a distance therefrom that the capacity between the antenna and the engine hood will be reduced to such a small value that it will have no effect on the reception of radio radiations by the antenna device. It will be seen that the antenna 50 will be completely insulated from its supporting members by the non-conducting bushings 59 and 63. An antenna lead wire 71, one end of which may be connected to the antenna wire terminal of a radio receiving set 72, is connected to the rear end of antenna 70 by any suitable means. As illustrated in the drawing, the lead wire 71 may be led through a conduit 73 extending through the rear supporting device 60 and through the connecting column 61 to the aperture within the bushing 63. If such a connection is provided, the lead wire may be conveniently led to the interior of the engine hood and to the receiving set mounted within the vehicle. Obviously, any other suitable means may be employed for electrically connecting the antenna to a receiving set.

In order to add rigidity to the assembly, the lower front and rear supporting devices 56 and 60 may be connected by a rod 75 which is screw-threaded at its ends in order to be connected to the respective front and rear supporting devices. In the constructional form shown in the drawings, the ends of the rod 75 are extended through the upper, cylindrical portions of the spring clip

members which are received within the supporting devices, and the extremities of the rods are screw-threaded to the front and rear extremities of the front and rear supporting members, respectively.

In order to provide a pleasing and ornamental appearance, the various supporting members of the antenna assembly may be so formed as to have a harmonious and pleasing relationship with the vehicle on which the antenna is mounted. To this end, the various members may be given rounded or streamlined contours, as shown, and a similarly-formed member 76 may be added to the forward end of the antenna rod, as illustrated. Further, in view of the fact that, in general, the engine hoods of automotive vehicles have some downward slope from the rear to the front thereof, the forward support for the antenna rod or wire 70 may be made slightly longer than the rear support, in order to support the antenna member in substantially horizontal position.

It will be apparent that, by virtue of the spring clip attaching devices, the antenna assembly may be rigidly but releasably attached to a vehicle in any desired position and may be removed therefrom without difficulty.

The antenna arrays described may be positioned on any desired part of the automobile or other vehicle. As illustrated in the drawings, the array is preferably attached to the usual hinge strip which extends longitudinally of the engine hood. In certain types of engine hoods this hinge strip may be replaced by an ornamental strip to which the array may be equally well attached. The attachment to the hinge strip, ornamental strip or other part of the vehicle is made by means of the spring clip, the lower legs thereof providing a means for easily but securely attaching the array to any suitable part of the body of the vehicle. On engine hoods of the so-called alligator type an antenna array formed according to the invention may be attached, by the spring clips, between the hood lock on the front of the hood and a mounting on the rear part of the hood. If desired, the antenna members may be curved to adapt the array to a curved portion of the vehicle.

I have found that the capacity existing between the antenna array and the metal engine hood may be reduced by either increasing the spacing between the members of the array and the hood, or by decreasing the diameters of the separate members of the antenna array. By properly choosing such spacing and diameters I have found that results which are far better than those provided by known constructions may be secured.

It will be seen that I have, by the present invention, provided an antenna device which may be resiliently but firmly and securely attached to the engine hood or other part of an automotive vehicle. While I have illustrated and described the various forms of my invention as being constructed in certain manners and as attached to parts of an automotive vehicle, it will be apparent to those skilled in the art that the invention is not limited in any way by such description and drawing which are illustrative only, and that the scope of the invention must be found in the appended claim.

What is claimed is:

In combination with a motor vehicle having an engine hood having an elongated member extending longitudinally thereof, a radio receiving antenna mounted on said vehicle and overlying and directly attached to said elongated member, said antenna comprising spaced supporting members, at least one elongated antenna rod having its ends attached to and insulated from said supporting members, spring clip devices connected to said supporting members and extending from the lower portions thereof and releasably engaging the elongated member to thereby attach the antenna to the engine hood, an electrical contact member slidably mounted on said antenna rod, and an electrical connection between said contact and radio receiving apparatus carried by the vehicle.

JAMES D. BORDER.