

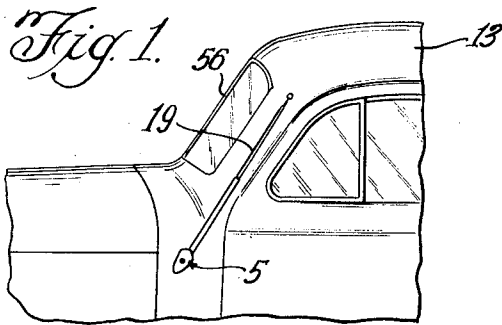
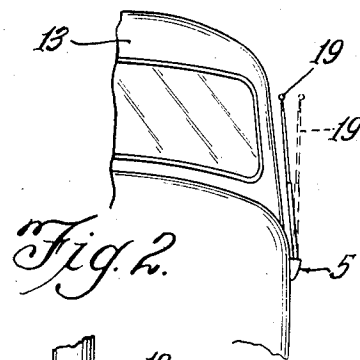
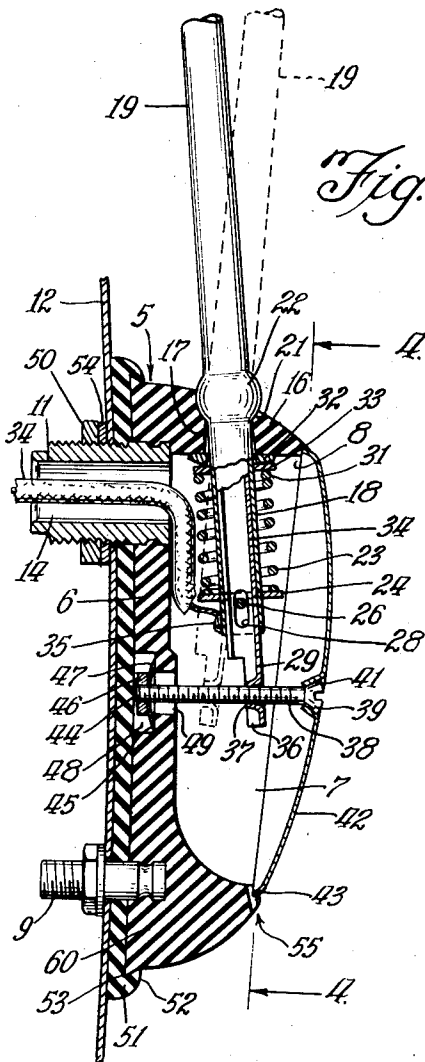
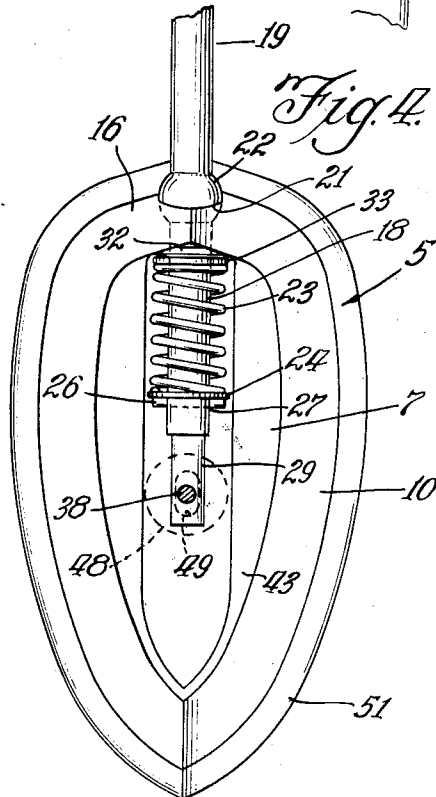
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RADIO ANTENNA

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RADIO ANTENNA

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This invention relates generally to radio antennae and in particular to an antenna unit for mounting on a side portion of a vehicle body and having an antenna member adjustably movable to a position in conformity with the slope or angle of such body side portion.

Antenna units for mounting on various portions of a vehicle body are well known. In order to present a neat appearance it is desirable that the angle at which the antenna member is supported conform substantially with the contour of the vehicle body. Where the antenna member is fixed in the antenna unit, it is evident that the angular position thereof is determined by the angle of the body portion on which the unit is mounted. The position of the antenna member may thus be at wide variance with the contour of the body portion with which it should conform to be pleasing in appearance. This variance in the angular matching of the antenna member with the car body is particularly objectionable where the antenna unit is mounted back of the engine hood since the projecting or sticking out of the antenna laterally away from the vehicle body appreciably detracts from the neatness and attractiveness of the vehicle.

It is an object of this invention, therefore, to provide an improved antenna unit for mounting on a vehicle body.

Another object of this invention is to provide an improved antenna unit for mounting on a vehicle body in which the antenna member is adjustably movable to conform with the slope or angle of the vehicle body.

Another object of this invention is to provide an antenna unit for mounting on the side portion of a vehicle body having an adjustably supported antenna member which is adjustable relative to the vehicle body, but independently of its supporting structure.

Yet another object of this invention is to provide an antenna unit for a vehicle which is compact and rugged in construction, flexible in application to a plurality of different makes of vehicles, comprised of a minimum of easily machined parts, and having an antenna member which is easily and simply adjustable to a position conforming to the angle of the vehicle body.

A feature of this invention is found in the provision of a vehicle antenna unit having a supporting member with a cavity therein and an adjustable antenna member pivotally supported on and extending through a wall portion of the cavity, the means for adjusting the antenna member being entirely within the cavity to provide

for an overall neat appearance of the antenna unit.

Further objects, features and advantages of this invention will become apparent from the following description when taken in connection with the accompanying drawing in which:

Fig. 1 is a fragmentary perspective side view of a vehicle body showing the antenna unit of this invention mounted thereon;

Fig. 2 is a fragmentary front perspective view of a vehicle body showing the antenna unit thereon with the antenna member in changed positions;

Fig. 3 is a vertical sectional view of the complete assembly of the antenna unit; and

Fig. 4 is a front view of the antenna unit as seen along the line 4—4 in Fig. 3.

Referring to the drawing the antenna unit of this invention is shown in Figs. 3 and 4 as including a longitudinally extending mounting or supporting member 5 having a substantially flat base portion 6 with a laterally projecting rim 10 thereon forming a cavity 7, the open side 8 of which is opposite the base portion 6. The supporting member 5 is of integral construction and molded in Bakelite or like material, with the studs or holding members 9 and 11 for securing the antenna unit to a side portion 12 of a vehicle body 13, being bonded in the base portion 6 during the molding operation. The holding member 11 is of a tubular construction, with the bore 14 therein being in registry with the cavity 7.

The rim portion 16 or upper end wall of the cavity 7, as viewed in Figs. 3 and 4, is formed with an aperture 17 extending therethrough for receiving the lower or lead-in end 18 of a tubular telescopic type antenna member 19. The upper cavity wall 16 about the top 21 of the aperture 17 is of substantially semi-spherical form to provide a mating seat for an annular shoulder or ball portion 22 formed on the antenna member 19 at a spaced distance from the lower end 18. The extension of the antenna 19 into the cavity 7 is thus defined by the engagement of the ball portion 22 in the seat 21. The walls of the aperture 17 diverge toward the cavity 7 to provide for a pivotal moving of the antenna 19 on the mounting unit 5, the annular seat 21 and ball portion 22 cooperating as a ball and socket pivotal support for the antenna.

Retention of the operative engagement of the ball and socket support 21—22 is accomplished by means including a coil spring 23 positioned in the cavity 7 and arranged in compression

about the antenna 19 between the upper cavity wall 16 and a retaining washer 24. The washer 24 is slidably mounted on the antenna member 19 and maintained in a position axially thereof by a holding pin 26 which extends through diametrically aligned apertures 27 formed in the antenna 19, and diametrically aligned slots 23 formed in an insert or connector member 29 to be later fully explained. Intermediate the top wall 16 and the end 31 of the spring 23 are metal washers 32 and 33 which are held against the wall 16, and hence retained in a position axially of the antenna 19 by the pressure of the spring 24. The washer 32 is of a construction to facilitate the pivotal action of the antenna member 19, the washer 31 being slidably engageable over the washer 32 for concurrent movement with the antenna 19. The lead in 34 to the radio receiving apparatus (not shown) enters the cavity 7 through the bore 14 in the tubular holding member 11, and is suitably connected, as by soldering, to the antenna 19 as indicated at 35.

The insert or connector member 29, previously mentioned, has a tubular portion 34 slidably supported within the lower end 18 of the antenna member 19, the slots 23 providing for the slidable movement of the member 29 relative to the pin 26. The tubular portion 34 is integrally formed with an axially extending peripheral portion 36 which projects outwardly from the antenna member 19 and is formed with a drawn or extruded aperture 37, the axis of which is at substantially right angles to the axis of the antenna 19. The aperture 37 is threaded for operative engagement with a threaded adjusting screw 38 for pivotally adjusting the antenna 19. The adjusting screw 38 is positioned coaxially with the axis of the aperture 37 and substantially normal to the base portion 6 and has an adjustment portion 39 at one end which is rotatably supported in a drawn aperture or bearing support 41 provided in a cover plate 42 for the open side 8 of the cavity 7. The cover 42 fits on a shoulder 43 formed on the inner periphery of the laterally extending rim 10. The opposite end 44 of the adjusting screw 38 extends through an elongated aperture 49 in the base portion 6 and into a recess 48 formed in the flat or outer side of such base portion. The screw end 44 has a nut 46 soldered thereon, a spring washer 47 being mounted at such end intermediate the nut 46 and the shoulder 45 formed at the junction of the recess 48 with the aperture 49, the recess being of a depth to completely receive the nut and spring washer therein. The spring washer 47 acts to pull or bias the adjusting screw 38 toward the left, as viewed in Fig. 3, to in turn pull the adjustment portion 39 against the cover 42 to retain the same seated on the member 5 at the shoulder 43. It is evident, therefore, from Fig. 3 that the cover 42 completely encloses the cavity 7, with only the adjustment portion 39 of the screw 38 being exposed and accessible for adjusting the antenna.

In the assembly of the antenna unit the member 29 is inserted in the lower end 18 of the antenna member 19, which in turn is inserted through the aperture 17 into the cavity 7 until seating engagement occurs between the ball portion 22 and its corresponding seat 21. The slots 28 and apertures 27 in the insert 29 and member 19 respectively, are diametrically aligned and faced toward the open side 8 of the cavity 7. The washers 32 and 31, the spring 23, and retaining washer 24 are then stacked in that order

about the lower end 18 of the antenna member 19, with the pin 26 being extended through the insert 29 and antenna 19 on compressing of the spring 23 between the upper wall 16 of the cavity 7 and the washer 24. The antenna is then rotated about 90° so that the pin 26 extends transversely of the cavity 7 to its position shown in Figs. 3 and 4. This rotation of the antenna 19 positions the axis of threaded aperture 37 in the connector portion 36 normal to the base portion 6 so as to be engageable with the adjustment screw 38. The adjusting screw 38 with the lock nut 46 and washer 47 removed from the end 44 thereof, is inserted through the opening 41 in the cover plate 42 and threaded in the aperture 37 until the end 44 is extended through the oval shaped opening 49 and into the recess 48. The spring washer 47 is first placed about the end 44 with the nut 46 then being threaded on the screw until the outer face thereof is substantially flush with the end 44 of the screw, or at least until the cover 42 is firmly engaged with the shoulder 43. The nut 46 is then soldered to the adjusting screw 38.

By virtue of the construction and support of the adjusting screw 38 and its relative assembly with the insert or connector member 29, rotation of the screw member, as by means of a screw driver or the like applied at the adjustment portion 39, pivotally moves the antenna 19 in a plane axially of the adjusting screw 38 and substantially normal to the plane of the base portion 6. Since the screw end 44 is movable within the washer 47 and in the elongated slot 49, movement thereof relative to the base portion 6 is provided so that the screw 38 is readily movable into an aligning position with the aperture 37 in the member 29 for all operating positions thereof.

In the mounting of the antenna unit to the side portion 12 of the vehicle body 13 there is provided a rubber gasket 51 which is attached to the base section 6 by the cooperating action of mating peripheral portions 52 and 53 formed on the gasket 51 and base portion 6, respectively. The gasket 51 is composed of rubber or like material and fits over the entire outer surface of the base portion 6 to completely enclose and cover the nut 46 and washer 47 in the recess 48. With the flexible gasket 51 arranged against the body portion 12, any slight relative variations in the respective contours of the body side portion 12 and outer surface of the base portion 6 are compensated for to assure a more secure fitting of the member 5 on the vehicle body. The tubular insert member 11 is extended through but spaced from the body portion 12 with the cooperating nut 50 thereon being firmly attached to the body 12 by a lock washer 54. From a consideration of Fig. 3, therefore, it is seen that the unit is entirely insulated from the car body 12. To provide for the elimination of any moisture which might seep into the cavity 7 through the aperture 17 or insert bore 14, a drain hole 55 is formed in the lower end wall 60 of the cavity.

The antenna unit is initially mounted on the vehicle body to provide for an angular position of the antenna 19 in conformity with the angle or contour of the vehicle body portion longitudinally thereof, such initial mounting being illustrated in Fig. 1 relative to the vehicle windshield 56. With the antenna unit thus initially set, adjustment of the antenna to a position in conformity with the angle or contour of the body portion 12 in a direction transversely of

the vehicle body is accomplished by manipulation of the adjustment portion 39. Thus, as is clearly illustrated in Fig. 2, the initial angular position of the antenna 19 relative to the slope or angle of the body side portion 12 is shown in dotted lines, with its angular movement transversely of the car body and to a position in conformity with the angle of such body portion, as accomplished by adjustment of the adjustment screw 38, being indicated in full lines. Referring to Fig. 3 the relative positions of the parts of the adjusting mechanism, when the antenna 19 is inclined inwardly toward the vehicle body is shown in full lines, with their positions with the antenna 19 adjusted outwardly from the vehicle body being shown in dotted lines. In one commercial embodiment of the invention the adjusting mechanism provides for an overall pivotal swinging or travel of the antenna of about 12°.

The invention is thus seen to provide an antenna unit for a vehicle which is neat and compact in appearance and readily adapted to provide for the adjustment of the antenna member thereof to a position in conformity with the angle or contour of the body of such vehicle. The invention is flexible in application to a plurality of vehicles of different makes to provide for its standardization and hence economy in cost of manufacture. The adjustable means for the antenna are completely and fully enclosed within the supporting structure therefor, with only the antenna during adjustment being movable relative to the vehicle body.

Although the invention has been described with reference to a specific embodiment thereof it is to be understood that it is not to be so limited since modifications and alterations in the parts and their relative arrangement can be made therein within the full intended scope of the invention as defined by the appended claims.

I claim:

1. An antenna unit for an automobile having a member for mounting on the side of the body of said automobile, said mounting member having a cavity therein with an opening extending through a wall of said cavity, an antenna member having one end inserted into said cavity through said opening, said antenna having an annular projecting portion thereon for seating on said mounting member at said opening, means in said cavity retaining said antenna seated on said mounting member but permitting pivotal movement thereof, and adjustable means in said cavity operatively connected with said one antenna end, with adjustment of said adjustable means pivotally moving said antenna member to a position in conformity with the slope of said body side.

2. In an antenna unit for an automobile having a body, a member for mounting on a side portion of said automobile body having an elongated cavity therein and an opening extending through an end wall of said cavity, a substantially vertical antenna member inserted through said opening with the lower end thereof in said cavity, said antenna having an annular shoulder portion engageable with said mounting member at said opening to pivotally support the antenna on said mounting member, means retaining said shoulder portion in engagement with said mounting member, an adjustable screw in said cavity, means operatively supporting said adjustable screw on said mounting member so

that the axis of said adjustable screw is substantially normal to said body side portion, and means operatively connecting said screw member and lower end of said antenna, with adjustment of said screw member pivotally moving said antenna member transversely of said automobile body to provide for a position thereof in conformity with the angle of said body side portion.

3. An antenna unit for mounting on a vehicle body, including an antenna rod, means for supporting said rod intermediate the end portions thereof, and means on said supporting means including a rotatable adjusting screw operatively connected to one end portion of said rod, with rotation of said screw pivoting said rod at its support relative to said vehicle body.

4. In an antenna unit for mounting on the side portion of an automobile body having an antenna member, means supporting said antenna member for movement to a position in conformity with the contour of said body side portion including an insulating member having a substantially flat base portion secured to said body portion and a cavity extending longitudinally thereof, said cavity being open on the side of said insulating member opposite said base portion and said insulating member having an aperture at one end thereof in registry with said cavity for inserting the lead-in end of said antenna member into said cavity, means pivotally supporting said antenna member on said insulating member so that said lead-in end is pivotally movable in said cavity, a cover for the open side of said cavity, an adjustable screw member in said cavity positioned substantially normal to said body side portion, means rotatably supporting one end of said screw member in said base portion, with said screw member having the other end thereof rotatably supported in said cover but extending therethrough, and means operatively connecting said adjustable screw member with said lead-in end of the antenna member, with adjustment thereof pivotally moving said antenna member in a plane substantially normal to said body side portion.

5. In an automobile antenna unit having a substantially vertically extending antenna member, means for mounting said unit on a side of the body of said automobile including a mounting member having a substantially vertically extending cavity therein open on one side, said mounting member having an opening in the top thereof in registry with said cavity, and said antenna member being inserted through said opening with the lower end thereof in said cavity, said antenna member having an annular projection thereon for seating on said mounting member at said opening, means in said cavity for retaining said annular projection in said seated position but permitting pivotal movement of said antenna member, a cover for the open side of said cavity, an adjustable screw member extending across said cavity in a direction substantially normal to said body side portion and rotatably supported on said mounting member and cover, and means connecting said screw member with the lower end of said antenna member including a connector member having one portion slidably supported on said antenna lower end, and another portion threadably engageable with said screw member, with adjustment of said screw member pivotally moving said antenna member in a plane substantially normal

to said body side to a position conforming to the contour of said body side.

6. In an antenna unit for mounting on a side portion of an automobile body having a substantially vertically extending antenna member, the combination of means providing for the pivotal adjustment of said antenna member in a plane substantially transversely of said car body to a position in conformity with the angle of said body side portion including a supporting member having a base portion secured to said body side portion, said supporting member having a cavity therein, with an opening in the top of said supporting member for receiving said antenna member being in registry with said cavity, means pivotally supporting said antenna member on said supporting member with the lower end portion thereof positioned in said cavity, connector means in said cavity on said antenna lower end portion, cover means on said base portion, and an adjustable screw member extending through said cover means in a direction substantially normal to the antenna member, said adjustable screw member being operatively engageable with said connector means within the cavity so that rotation thereof moves the connector means and pivotally moves said antenna member therewith.

7. In an antenna unit for mounting on the side portion of an automobile body having a substantially vertically extending tubular antenna member, means providing for adjustment of said antenna member in a plane substantially normal to said body side portion to a position in conformity with the angle of said side portion including a supporting member having a substantially vertically extending cavity therein, said supporting member having an aperture in the top thereof extending into said cavity, with said antenna being inserted in said aperture with the lower end thereof positioned in said cavity, and having a ball portion spaced from said lower end for engaging said supporting member at said aperture, a tubular insert slidably supported in the lower end of said antenna member and having an axial projection extending outwardly from said antenna member, said projection having a threaded aperture with the axis thereof positioned substantially normal to said body side portion, and an adjustable screw member operatively supported in said supporting member for engagement with the tubular insert at said threaded aperture, with rotation of said adjustable screw member pivotally moving said antenna member.

8. In an antenna unit for mounting on the side portion of an automobile body having a substantially vertically extending antenna member, means for pivotally adjusting said antenna member in a plane transversely of said automobile body to a position conforming to the slope of said body side portion, including an insulating mounting member having a substantially flat side wall thereof secured to said body side portion, said insulating member having a cavity therein open on the side thereof opposite said flat side wall, said cavity having a top wall with a vertically extending opening therethrough, and an annular seat about said opening at its upper end, said antenna member being inserted through said opening with the lower end thereof in said cavity

and having an annular shoulder spaced from said lower end for operatively engaging said annular seat to pivotally support said antenna member on said mounting member, annular means on said antenna member near said lower end, tension means positioned about said antenna member and arranged in compression between said annular means and cavity top wall to retain said antenna member seated on said mounting member, an adjustable screw member in said cavity, means rotatably supporting said screw member with the axis thereof substantially normal to the flat side of said mounting member, and means operatively connecting said adjustable screw and the lower end of said antenna member so that adjustment of said screw pivotally moves said antenna member.

9. An antenna including in combination, a body portion having a mounting seat thereon and a cavity within such portion, antenna means having a mounting portion seated on said mounting seat and an end portion within said cavity, spring means on said end portion anchored at one end relative thereto and pulling said mounting portion toward said mounting seat to maintain said mounting portion thereon, and means operatively connected with said end portion within said cavity maintaining said antenna means in a desired position relative to said body portion.

10. An antenna unit adapted to be mounted on a vehicle body and including an antenna rod, means pivotally supporting said antenna rod, a rotatable adjusting screw carried on said supporting means, and a portion operatively connecting said screw and antenna rod to pivotally move said antenna rod relative to said vehicle body in response to a rotation of said adjusting screw, with said adjusting screw having an adjustment portion thereon adjustable from the outside of said vehicle body.

11. An antenna unit adapted to be mounted on the side portion of a vehicle body including an antenna member, means pivotally supporting said antenna member for pivotal movement in a path substantially normal to the plane of said side portion, a rotatable adjusting screw having the axis thereof normal to said plane, a portion threadably connected with said screw and slidably connected with said antenna member for movement axially thereof to pivotally move said antenna member relative to said side portion on rotation of said screw, and an adjustment portion on said screw adjustable from outside of said vehicle body.

12. An antenna including in combination, a body portion having a cavity therein, antenna means having a mounting portion mounted for pivotal movement on said body portion with an end portion terminating within said cavity, a rotatable adjusting screw extended within said cavity and rotatably supported in at least one wall thereof, and means operatively connecting said adjusting screw and said end portion having a portion threadable on said screw, said screw, when rotated, moving said connecting means to pivotally move said antenna means in a defined path to an adjusted position relative to said body portion, with said antenna means being retained in said adjusted position by said screw and connecting means.

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