March 31, 1959 W. J. RACE 2,880,265

ANTENNA

Filed Nov. 12, 1953

Fig. 1.

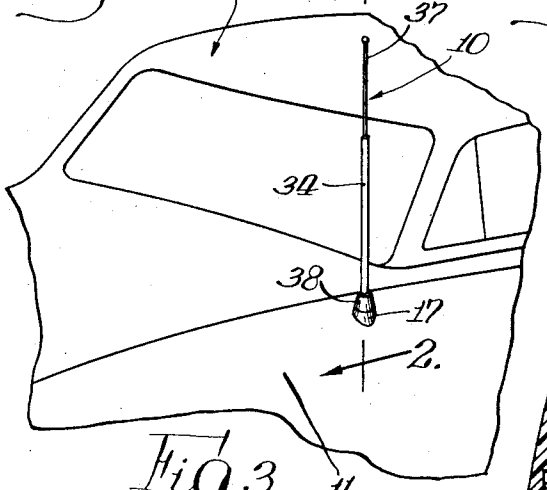


Fig. 2.

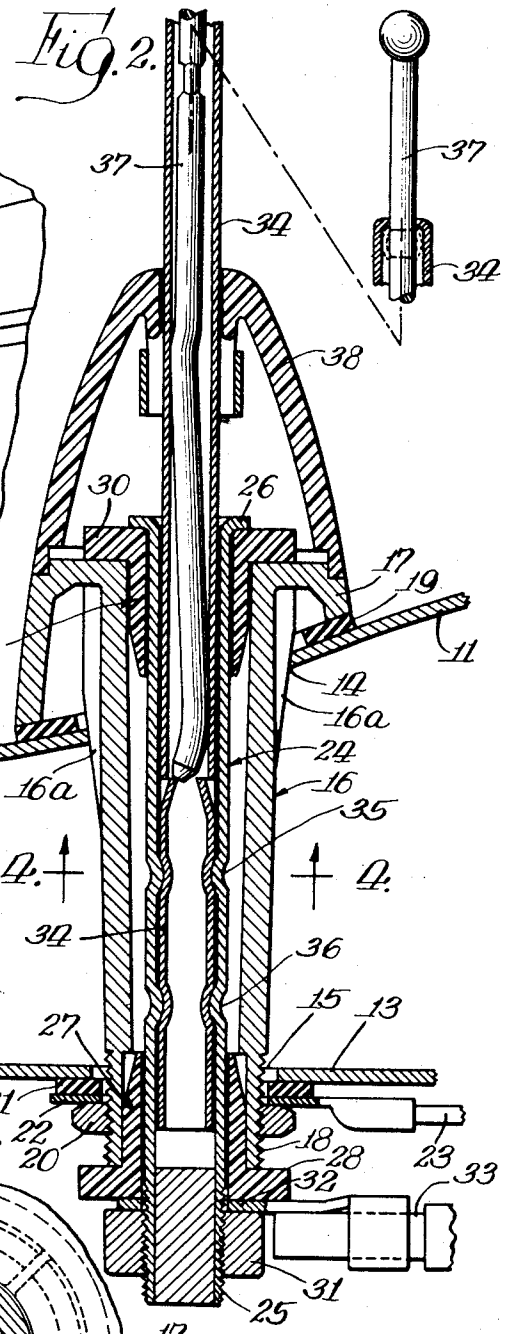


Fig. 3.

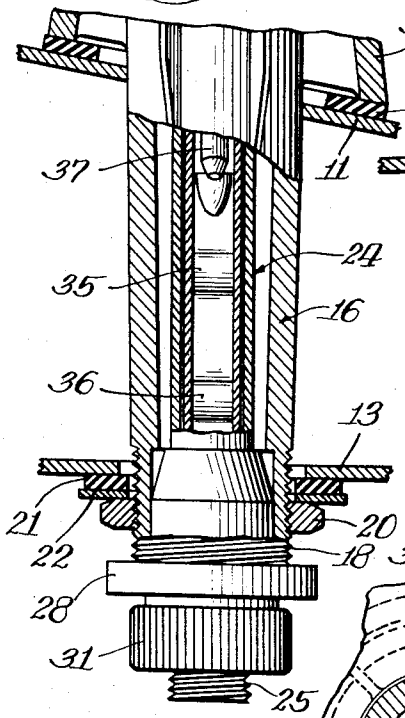
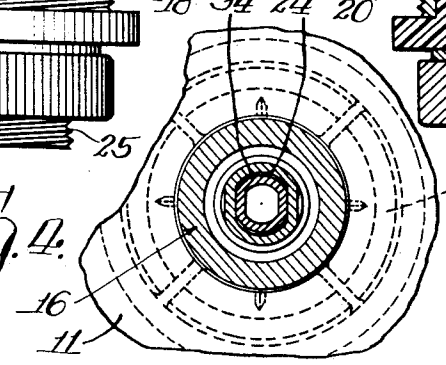


Fig. 4.



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2 Claims. (Cl. 174—152)

The present invention relates to antennas and more particularly to an improved mounting structure for supporting an antenna on the wall of a vehicle or the like and for providing electrical connection to the antenna.

Most present day vehicle antennas are in the form of the extensible vertical type, and it is usual to mount such antennas on the fender or other portion of the automobile. Copending application Serial Number 228,882, filed May 29, 1951, in the name of William J. Race et al., entitled, "Antenna for Vehicle Mounting," and assigned to the present assignee, which issued as Patent 2,693,333 on November 2, 1954, discloses and claims a convenient arrangement for mounting such a vertical antenna upon the fender, cowl or other portion of an automobile. The mounting structure of the copending application provides for a convenient mounting directly on the wall of the vehicle constituting a fender or other portion thereof. However, in some applications it has been found that the fender wall of an automobile is too thin and flexible to provide an adequate supporting surface for the antenna.

The present invention is directed to a mounting structure which may conveniently be used in the applications referred to above in which the fender wall is insufficiently rigid to support the antenna so that a further supporting bracket within the automobile must contribute to the support of the antenna.

It is, accordingly, an object of the present invention to provide a vehicle antenna that may be supported in an improved and simplified manner between a wall of a vehicle and an internal bracket spaced from the wall.

A further object of the invention is to provide such a vehicle antenna supported in an improved manner between a wall of a vehicle and an internal bracket spaced from the wall, and which includes improved and simplified means for establishing electrical connections thereto.

A feature of the invention is the provision of an antenna arranged to be mounted between an outer wall of an automobile and an inner bracket spaced from the wall by means of a tubular mounting member supported between the wall and bracket in a manner such that the mounting member is supported by and grounded to the wall. The antenna further includes a tubular antenna supporting member mounted coaxially within the mounting member and insulated therefrom, the antenna supporting member extending through the inner bracket beyond the end of the mounting member and including electrical terminal means adjacent the end of the mounting member.

The above and other features of the invention which are believed to be new are set forth with particularity in the appended claims. The invention itself, however, together with further objects and advantages thereof may best be understood by reference to the accompanying drawing in which:

Fig. 1 shows an extensible vertical vehicle antenna mounted on the fender of an automobile by the mounting structure of the invention;

Fig. 2 is a sectional view of the antenna of Fig. 1 taken along the lines 2—2 to illustrate the improved mounting structure of the present invention;

Fig. 3 is another view, partly in section, of the mounting structure taken at right angles to the view of Fig. 2; and

Fig. 4 is a cross-sectional view of the structure taken along the lines 4—4 of Fig. 2.

The invention provides a vehicle antenna to be supported between a wall of a vehicle having an opening therein and a supporting bracket in the vehicle spaced from the wall which also has an opening aligned with the opening in the wall. The structure comprises an elongated tubular mounting member having a shoulder portion at one end adapted to overlie the opening in the wall on the side thereof remote from the supporting bracket and having a threaded portion at the opposite end thereof adapted to extend through the opening in the supporting bracket. The tubular mounting member includes a tapered portion for securing the same firmly in the wall opening and for making electrical contact with the wall. A nut is threaded to the threaded portion of the mounting member on the opposite side of the mounting bracket for drawing the shoulder portion firmly against the wall and for holding the mounting member between the wall and supporting bracket. A tubular supporting member for the antenna is mounted coaxially within the tubular mounting member and insulated therefrom, the supporting member having an end portion projecting beyond the threaded portion of the mounting member, and means is associated with the projecting end portion of the supporting member for providing an electrical terminal therefor.

With reference now to the drawings, Fig. 1 illustrates as previously stated, a vertical extensible antenna **10** extending through the fender **11** of an automobile **12**. In most automobile constructions, fender **11** has a fire wall **13** spaced therefrom, and the latter may serve as the supporting bracket for the antenna mounting structure when the fender wall has insufficient strength to support the antenna by itself.

As more clearly shown in Fig. 2, the antenna is supported between fender wall **11** which has an aperture **14** therein, and mounting bracket **13** which has an aperture **15** therein aligned with aperture **14**.

The structure includes an elongated tubular mounting member **16** having an integral shoulder portion **17** at its upper end adapted to overlie opening **14** on the side of wall **11** remote from bracket **13**. Tubular mounting member **16** also has a threaded portion **18** at the lower end thereof which extends through opening **15** in the supporting bracket. An annular sealing washer **19** is provided in coaxial relation with the tubular mounting member **16**, and this sealing washer is interposed between the shoulder portion **17** and wall **11**. The sealing washer serves to prevent moisture from entering aperture **14**, and it may be composed of neoprene or any other suitable sealing material.

A nut **20** is threaded to the threaded portion **18** of tubular mounting member **16** for drawing the shoulder portion **17** firmly against the sealing washer **19** and for securely holding the mounting member between wall **11** and supporting bracket **13**. A sealing washer **21** is provided for surrounding aperture **15** to provide a moisture-proof joint, and a ground connection can be made to member **16** by retaining a lug **22** between nut **20** and the sealing washer, the lug being connected to a suitable ground lead **23**. Member **16** is grounded to fender **11** by a series of tapered ribs **16a** which are wedged against the edges of aperture **14** as nut **20** is tightened.

A tubular electrically conductive antenna supporting member **24** for the antenna is mounted coaxially within mounting member **16**, and the supporting member has a threaded portion **25** at its lower end projecting beyond threaded portion **18** of the mounting member and a radially projecting portion **26** at its upper end.

A first insulating sleeve 27 is mounted at the lower end of supporting member 24 coaxially within threaded portion 18 of mounting member 16 for insulating the supporting member therefrom, and the sleeve has an annular portion 28 projecting radially outward to overlie the lower end of the mounting member. A second insulating sleeve 29 is provided at the upper end of supporting member 24 which is mounted coaxially within mounting member 16 for insulating the supporting member therefrom, and sleeve 29 has an annular portion 30 projecting radially outward to overlie the shouldered end of the mounting member. The projecting portion 26 of antenna supporting member 24 overlies sleeve 29 so as to maintain the supporting member against downward motion in mounting member 16.

An nut 31 is threaded on the threaded portion 25 of supporting member 24, and the lug 32 of an antenna lead 33 is interposed between nut 31 and portion 28 of sleeve 27 so that the nut holds member 24 coaxially within member 16 and provides an electrical terminal for member 24.

A tubular portion 34 of a vertical antenna is mounted coaxially within supporting member 24 in electrical contact therewith, and these elements are staked together by beads 35 and 36. The antenna has an extensible portion 37 in the form of a metallic rod coaxially slidable in tubular portion 34 and having well known configuration so that it may frictionally engage portion 34 at any desired extended position. The assembly also includes a bell-shaped trim cap 38 of insulating material coaxial with and frictionally engaging portion 34 to enclose the upper end of the mounting structure.

With the improved mounting and connecting structure of the present invention, a vertical extensible antenna may be rigidly and securely held in an automobile and appropriate electrical connections can be made to the antenna in a simple and expeditious manner. The antenna is extremely simple to mount since there is no need for any connections to be made in the space between the fender wall 11 and the fire wall bracket 13, this space usually being inaccessible. As can be seen, the antenna can be mounted by the simple operation of inserting mounting member 16 through the opening and threading nut 20 to the threaded portion thereof. Moreover, electrical connections can be made to the antenna by the simple nut and lug arrangement at the lower end of antenna supporting member 24. In addition, a convenient ground connection can be provided by mounting member 16 in the manner previously described herein.

While a particular embodiment of the invention has been shown and described, modifications may be made and it is intended in the appended claims to cover all such modifications as fall within the true spirit and scope of the invention.

I claim:

1. An antenna mounting structure for supporting an antenna on a vehicle, said vehicle having a wall with an opening therein and also having an internal supporting bracket with an opening therein and spaced from the wall, said structure including in combination, an elongated tubular mounting member having a shoulder portion at one end adapted to overlie the opening in the wall on the side thereof remote from the supporting bracket, said member having a threaded portion at the other end thereof adapted to extend through the opening in the supporting bracket and said mounting member having longitudinally extending tapered ribs adapted to extend through said opening and engage the sides thereof to connect said mounting member to the wall, a nut engaging said threaded portion on the side of the mounting bracket remote from the wall for drawing said shoulder portion firmly against the wall and for holding said mounting member between the wall and the supporting bracket and said ribs against the sides of the opening in the wall, an electrically conductive tubular antenna supporting member mounted coaxially within said mounting member, a pair of insulating sleeves disposed at the respective ends of said mounting member for insulating said supporting member therefrom and having respective annular portions overlying said respective ends of said mounting member, said antenna supporting member having a projection at one end extending radially outward and overlying said annular portion of one of said insulating sleeves and said supporting member having a threaded portion at its other end extending through the other one of said insulating sleeves beyond said threaded portion of said mounting member, a nut engaging said threaded portion of said antenna supporting member to form an electrical terminal for said supporting member and to maintain said supporting member coaxially within said mounting member, a tubular antenna mounted coaxially within said antenna supporting member and affixed thereto, said antenna extending outwardly from the wall on the side thereof remote from the supporting bracket, and a bell-shaped trim cover cap of insulating material coaxial with and frictionally engaging an extending portion of said tubular antenna to enclose the upper end of said mounting structure.

2. An antenna to be mounted on a vehicle, said vehicle having a metallic wall with an opening therein and also having an internal supporting bracket with an opening therein and spaced from the wall, said antenna including in combination, an elongated tubular metallic mounting member having a shoulder portion at one end adapted to overlie the opening in the wall on the side thereof remote from the supporting bracket, said mounting member having longitudinally extending tapered ribs at said one end adapted to extend through said opening and engage the sides thereof to connect said mounting member to the wall, a sealing washer coaxial with said mounting member to be interposed between said shoulder and the wall, said mounting member having a threaded portion at the other end thereof adapted to extend through the opening in the supporting bracket, a nut engaging said threaded portion on the side of the mounting bracket remote from the wall for forming a ground terminal and for drawing said shoulder portion firmly against said sealing washer and said ribs against the sides of the opening in the wall so as to hold said mounting member between the wall and the supporting bracket, an electrically conductive tubular antenna supporting member mounted coaxially within said mounting member, a pair of insulating sleeves disposed at the respective ends of said mounting member for insulating said supporting member therefrom and having respective annular portions overlying said respective ends of said mounting member, said antenna supporting member having a projection at one end extending radially outward and overlying said annular portion of one of said insulating sleeves and said supporting member having a threaded portion at its other end extending through the other one of said insulating sleeves beyond said threaded portion of said mounting member, a nut engaging said threaded portion of said antenna supporting member to form an electrical terminal for said supporting member and to maintain said supporting member coaxially within said mounting member, and a rod mounted coaxially within said antenna supporting member and staked thereto, said rod extending outwardly from the wall on the side thereof remote from the supporting bracket.

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