

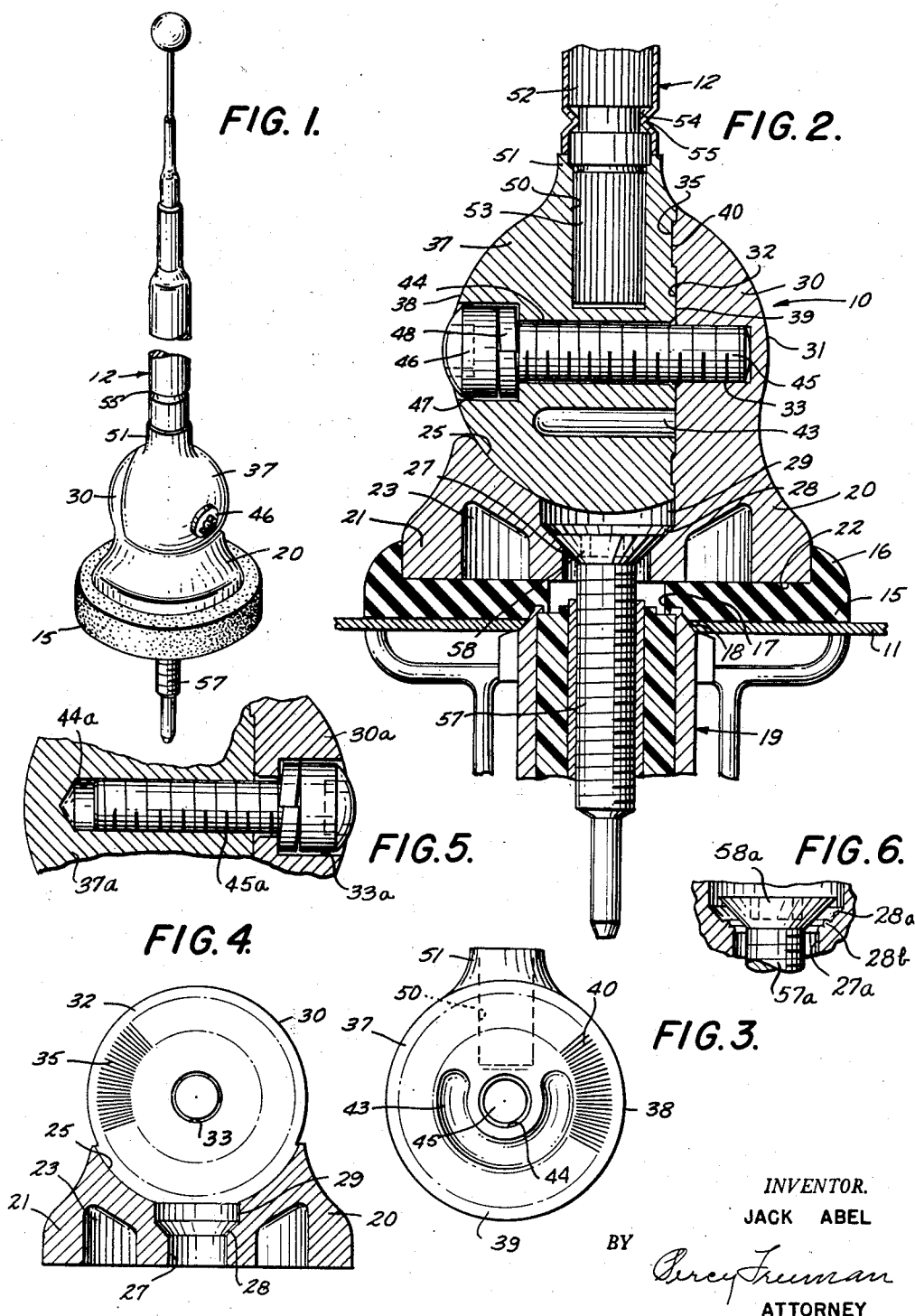
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ANTENNA MOUNT FOR VEHICLES

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ANTENNA MOUNT FOR VEHICLES

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This invention relates generally to antenna mounts, and is particularly directed to antenna mounts of the type adapted for attachment to vehicles.

The particular embodiment of the present invention, which is illustrated in the drawings and which will be described hereinafter in greater detail, comprises generally a base piece having an outstanding ear and adapted for attachment to the exterior of a vehicle body, and an aerial carrying member adjustably mounted in said base piece and releasably clamped to said ear.

As is well known to those versed in the art, prior antenna mounts for vehicles involved considerable labor in their installation, often requiring the workman to reach relative inaccessible places inside of and beneath the vehicle body. Further, it was usually necessary to employ different styles or types of antenna mounts for different models and makes of cars, as well as for different positions on the same car, which, of course, involved the maintenance of large stocks. In many instances, it was necessary to custom mount antennas when a fixture was not available for the desired location on a particular model car. While it has been attempted to provide antenna mounts capable of use on more than one vehicle and at different locations on the vehicle, such devices have proved unsatisfactory as presenting difficult installation problems, and involving numerous parts which tend to loosen and rattle in use. Further, these antenna mounts have been found to provide different, and often unsatisfactory operating characteristics, such as excessive electrical resistance, under various conditions of use.

Accordingly, it is a general object of the present invention to provide an antenna mounting device which fully overcomes the above-mentioned difficulties, wherein a single mount is capable of being attached to any make or model of automobile, at any desired location on the vehicle body, and which can be quickly and easily installed or attached by personnel of only ordinary skill, with a minimum of effort.

It is a more particular object of the present invention to provide an antenna mount construction having the advantageous characteristics mentioned in the foregoing paragraph, and which operates with equally good results under all conditions of use.

In particular, the antenna mount construction of the instant invention insures substantially the same electrical contact when attached to any car at any location thereon.

It is a further object of the present invention to provide an antenna mount of the type described which is simple and rugged in construction, requiring a minimum of parts, which is sturdy and durable in use so as to be free from loosening of connections and rattling, and which is attractive in appearance and can be manufactured, installed and maintained at a reasonable cost.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of

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construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

In the drawings:

Fig. 1 is a perspective view showing an antenna and mount therefor constructed in accordance with the present invention.

Fig. 2 is a partial, vertical sectional view, greatly enlarged, showing the antenna mount construction of Fig. 1.

Fig. 3 is an elevational view showing one part or member of the mount, removed from the assembly.

Fig. 4 is a vertical sectional view showing another element of the mount, removed from the assembly.

Fig. 5 is a fragmentary sectional view similar to Fig. 2, but showing a slightly modified form of the invention.

Fig. 6 is a fragmentary sectional view similar to Fig. 2, and showing another slightly modified form of the invention.

Referring now more particularly to the drawings, an antenna mount, generally designated 10, is illustrated as attached to an auto body 11, and supports an outwardly projecting antenna or aerial 12.

As best seen in Fig. 2, the mount includes a pad or support 15, which is preferably fabricated of rubber or other yieldable, insulating material, and disposed with one face in engagement with the exterior surface of the auto body 11. That is, the support or pad 15 is of generally circular, sheet-like configuration, including an upstanding circumferential ridge or wall 16, and formed with a centrally disposed, through aperture 17.

The vehicle body 11 is prepared for installation of the antenna mount by merely drilling a through hole 18 in the body at the location desired for the antenna mount, and disposing a coupling 19 interiorly of the vehicle body adjacent to the aperture 18.

Seated on the outer face of the support member or pad 15, conformably received within the wall 16, is a cup-like base piece 20. That is, the lower or inner portion 21 of the base piece 20 is of generally circular outline and has a substantially flat inner or under surface 22 for firm engagement with the outer or upper surface of the support pad 15. For lightness and economy the lower portion 21 of the base piece 20 may be formed with an annular, downwardly opening recess or core hole 23.

The upper or outer side of the base piece 20 is formed with an outwardly facing, spherical concave surface 25 defining an outwardly opening base piece recess. The spherical recess 25 is positioned with its center of curvature substantially coaxial or in alignment with the center of the pad 15 and circular lower base piece portion 21. Further, a through bore or hole 27 is formed in the base piece 20 radially of the spherical recess 25 and coaxially of the lower base piece region 21 so as to register with the pad opening 17 and vehicle body opening 18. It will be noted that the base piece bore or hole 27 is counter sunk, so as to flare upwards at 28 and terminates in an enlarged upper end portion 29 which opens outwards into the recess 25.

An outwardly projecting ear or lug 30 is formed on the base piece 20, integral therewith, and is configured to define a spherical segment having its center substantially coincident with the center of curvature of the spherical recess 25. Viewed otherwise, the ear or lug 30 projects outwards or upwards from the base piece 20, on one side of the recess 25 and hole 27, and has its outer surface 31 spherically convex with its radius of curvature substantially equal to that of the recess 25, and its center of curvature substantially coincident with the center of curvature of the latter recess. The inner side or face 32 of the lug 30 is of generally flat, circular configuration,

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facing toward the recess 25, and provided with a centrally located, internally threaded bore 33 disposed generally radially of the spherical segment or ear 30 and normal to the axis of the bore 27. In addition, a plurality of circumferentially arranged teeth or serrations 35 are formed on the lug face 32, preferably shaped to extend radially of the lug face. The base piece 20 and lug 30 are preferably formed integrally, as illustrated, and fabricated of any suitable, electrically conductive material.

Disposed in side by side facing engagement with the lug 30, and partially received within the recess 25 is an aerial carrying member 37, configured to define a spherical segment complementary to the spherical segment or lug 30. That is, the member 37, which is also fabricated of electrically conductive material, is shaped and arranged to combine with the lug 30 and define a substantially complete sphere or ball. More particularly, the member 37 includes one convex spherical surface 38, which has a radius of curvature substantially equal to that of the recess 25 and lug surface 31, and has its center of curvature substantially coincident with that of the recess and lug surfaces. Further, the spherical segment 37 has one face 39 of substantially flat, circular configuration of a size substantially equal to and in facing engagement with the lug surface 32. Formed on the face 39 of the member 37 are a plurality of circumferentially arranged grooves 40, preferably disposed radially of the face, and adapted to respectively receive the serrations 35 of the face 32. When the faces 39 and 32 of the member 37 and lug 30 are not forcibly engaged together, the member 37 will obviously be rotatable about the axis of the bore 33, having a constant area of its convex surface 38 always in engagement with the concave recess surface 25.

The member 37 is preferably provided with an arcuate recess or hollow 43 which may open through the face 39, to lighten the member. Extending radially inwards through the convex segment surface 38, in alignment with and opening into the threaded bore 33 is a smooth bore 44. That is, the smooth bore 44 extends entirely through the spherical segment 38, radially thereof, and is disposed normal to the base piece bore 27.

A threaded fastener 45 is inserted rotatably through the smooth bore 44 and threadedly into the bore 33, having an enlarged head 46 received in an enlarged portion 47 of the bore 44. A split, resilient ring or lock washer 48 is circumposed about the fastener 45 and bears against the spherical segment 37 and fastener head 46 to resiliently maintain the spherical segment in firm abutting engagement with the lug 30. Further, upon loosening or slight withdrawal of the screw 45, the spherical segment 37 may be rotated about the axis of the fastener 45.

Extending radially into the spherical segment 37, and disposed normal to the through bore 44, is a blind bore 50, preferably having an annular lip 51 extending about its open end. Obviously, the spherical segment 37 may be rotated about the axis of the fastener 45 to swing the bore 50 into alignment with the bore 27, the position illustrated in Fig. 2, and out of such alignment, as desired. A plug 52 having a knurled end portion 53 and an annular recess or groove 54 spaced from the end portion, is arranged with the knurled end portion force-fit in the bore 50; and, a tubular aerial 12 is engaged over the projecting rod portion and turned or upset into the groove 54, as at 55. In this manner, the aerial 12 is permanently attached to the spherical segment 37 and projects outwards from the latter.

A fastener 57, which is fabricated of conductive material and formed with a conically shaped head 58, is inserted inwards through the bore 27 of the base piece 20, hole 17 of the pad 15, and the aperture 18 of the auto body 11, for securement, as by threaded engagement, to the coupling 19. The inner end of the fastener 57 is electrically connected by any suitable means to a radio or the like, and the fastener is screwed down to

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snugly and forcibly engage the conical fastener head 58 in the counter sink 28 of the bore 27, with the fastener head spaced below the surface of the recess 25.

Before tightening of the fastener 57, the base piece 20, lug 30 and spherical segment 37 may be rotated in unison about the axis of the fastener to any desired position of adjustment. The fastener 57 may then be tightened, causing the yieldable, insulating pad 15 to bear hard against the vehicle body and substantially conformably engaging with any shape body surface to fix the base piece 20 against rotation about the fastener axis. Further, the conical fastener head 58 insures firm electrical contact with the counter sink 28 and effectively prevents inadvertent or accidental lateral shifting of the base piece.

As noted hereinbefore, the spherical segment 37 may be rotated about the axis of the fastener 45 and immovably clamped against the lug 30 in any position of its rotation by tightening of the latter fastener. Hence, the spherical segment 38 is afforded universal adjustment, being rotatable about the perpendicular axes of the fasteners 57 and 45, so that the aerial may be disposed to project vertically regardless of the particular disposition of the base piece 20, as determined by the particular location on the vehicle body.

As the lug face 39 and the face 40 of the spherical segment 37 are disposed in facing engagement over their entire surfaces in all positions of rotation of the spherical segment, and as the surface 38 of the spherical segment 39 has a portion of constant area in contact with the recess surface 25 in all positions of rotation of the spherical segment, the electrical resistance of the antenna mount, say between the aerial 12 and fastener 57, will be substantially the same in all positions of aerial adjustment.

In the embodiment of Fig. 5, the spherical segment or lug 30a is provided with a through, countersunk bore 33a. The spherical segment or member 37a is provided with a blind bore 44a, which is internally threaded for receiving a threaded fastener or screw 45a. Thus, the modification of Fig. 5 permits the insertion and withdrawal of the screw 45a through the segment 30a and into the segment 37a. As the latter segment is of greater thickness, the bore 44a need not be bottom finish, as may be necessary in the bore 33 of the first described embodiment.

In the modification of Fig. 6, the countersunk bore 27a, corresponding to the countersunk bore 27 of Fig. 2, has its countersunk portion 28a provided with one or more internal, peripheral or annular ridges 28b. These ridges may be of any suitable cross-section, such as the rectangular or stepped shape shown in Fig. 6, and are of sufficiently small proportions so as to deform when engaged by the head 58a of the fastener 57a. This deformation of the ridges 28b, when engaged by the fastener head 58a, has been found to insure intimate electrical contact between the fastener and base piece 20, and prevent the passage of moisture therebetween.

From the foregoing, it is seen that the present invention provides an antenna mount which fully accomplishes its intended objects, and is well adapted to meet practical conditions of manufacture, installation and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. An antenna mount for a vehicle, said mount comprising an insulating support adapted to seat on the exterior of a vehicle body, a conductive base piece on said support and formed with an outwardly opening recess; a conductive fastener extending inwards through said base piece, support and vehicle body for fixing said base piece relative to said vehicle body, the inner end of said fas-

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tener being adapted for electrical connection to a radio, an integral lug projecting outwards from said base piece on one side of said recess, a conductive member disposed alongside of said lug and rotatably received in said recess, holding means for releasably clamping said member against said lug in any desired position of member rotation, and an elongate aerial projecting from said member.

2. An antenna mount according to claim 1, wherein said recess is of concave spherical configuration, said member being of convex spherical configuration for rotative engagement in said recess.

3. An antenna mount according to claim 1, said support comprising a resilient yieldable pad adapted for conforming, non-abrasive engagement with said vehicle body.

4. An antenna mount according to claim 1, wherein said fastener includes a head seated in said base piece below the surface of said recess, to allow unobstructed rotative movement of said body.

5. An antenna mount according to claim 1, wherein the adjacent sides of said lug and member are serrated for increased holding engagement when said member is clamped against said lug.

6. An antenna mount adapted for attachment at any desired location on a vehicle body, said mount comprising an insulating support adapted to seat on the exterior of said vehicle body, a conductive base piece on said support and formed with an outwardly opening recess, an elongate conductive fastener having one end seated in said base piece below the surface of said recess and having its other end extending inwards through said base piece, support and vehicle body to fixed said base piece relative to said body in any selected position of rotation about the axis of said fastener, the inner end of said fastener being adapted for electrical connection to a radio, an integral lug projecting outwards from said base piece on one side of said recess, a conductive member disposed alongside of said lug and received in said recess for rotation relative to said base piece about an axis transverse of said fastener axis, means for locking said member in any selected position of rotation about said transverse axis, said member thus being universally adjustable about said fastener and transverse axis, and an aerial projecting from said member and adapted to extend in any desired direction by said universal adjustment.

7. An antenna mount according to claim 6, said fastener extending rotatably through said base piece and support and having one fastener end releasably clamping said base piece in position.

8. An antenna mount according to claim 7, wherein said recess is of concave spherical configuration, said member being of convex spherical configuration for rotative engagement in said recess, and said fastener including a head seated in said base piece below the surface of said recess to allow unobstructed rotative movement of said member.

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9. An antenna mount according to claim 6, said locking means comprising a second fastener disposed transversely of said first fastener and extending into said member and lug for releasably clamping said member against said lug in any desired position of member rotation.

10. An antenna mount according to claim 9, said lug and member being configured and arranged to define complementary spherical segments, and said base piece recess being of concave spherical shape to rotatably receive said member, so that the area of contact of said member with said lug and base piece, and consequently the electrical resistance between said member and first fastener, is substantially the same in all positions of member adjustment.

11. An antenna mount adapted for attachment at any desired location to a vehicle body, said mount comprising a yieldable insulating support pad adapted to rest upon the exterior of said vehicle body, a conductive base piece having its inner side seated on said pad and having its outer side formed with an outwardly facing recess, a headed fastener fabricated of conductive material having its head seated in said base piece below the surface of said recess and extending inwards rotatably through said base piece, pad and vehicle body to fix said base piece relative to said vehicle in any selected position of rotation about the axis of said fastener, the inner end of said fastener being adapted for electrical connection to a radio, an ear projecting outwards from said base piece on one side of said recess, a conductive member disposed in side by side facing engagement with said ear and partially received in said recess, a second fastener transversely of said first named fastener through said member and into said ear to rotatably support said member and releasably clamp the latter against said ear in any selected position of its rotative movement, said member thus being universally adjustable about the axes of said first and second named fasteners, and an aerial projecting from said member and adapted to extend in any desired direction by said universal adjustment.

12. An antenna mount according to claim 11, wherein said base piece and pad are formed with registering through holes spacedly receiving said first named fastener, the hole in said base piece being counter sunk, and the head of said first named fastener being conical for snug reception in the counter sink of said base piece hole to insure electrical contact with and prevent lateral shifting of said base piece.

13. An antenna mount according to claim 12 wherein the countersunk surface of said hole has a plurality of concentric annular ridges which are deformable by pressure of the conical head of said first named fastener as it is being drawn home.

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