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MOUNTING DEVICE FOR MOBILE ANTENNA

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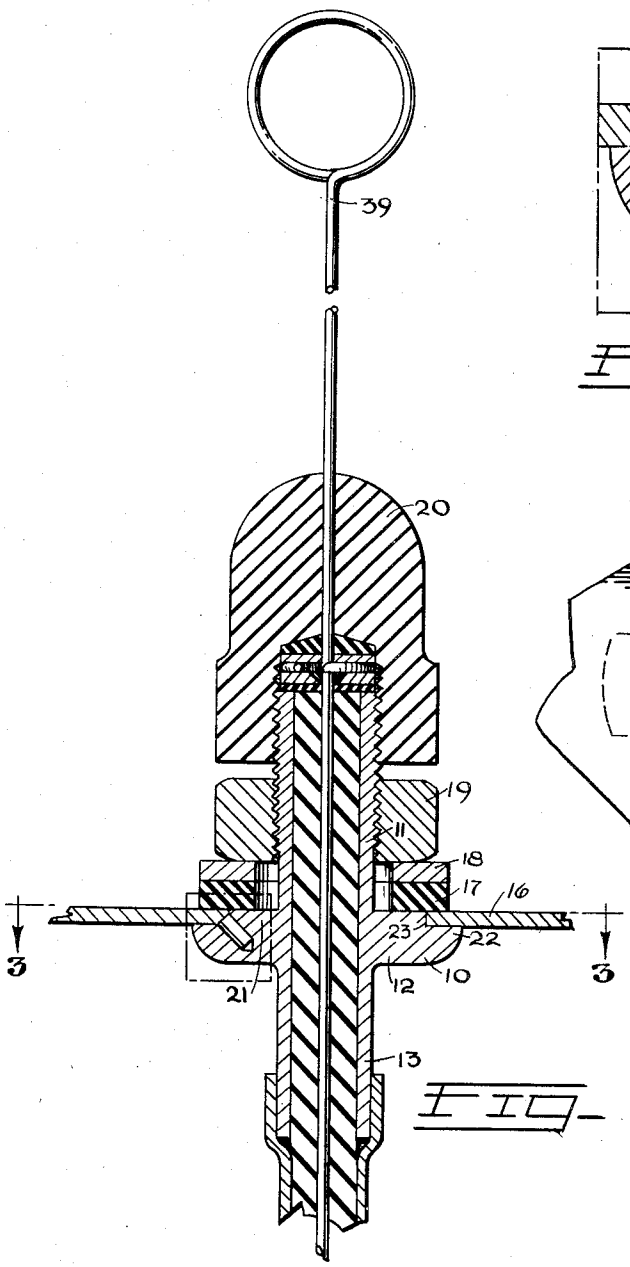


FIG. 1

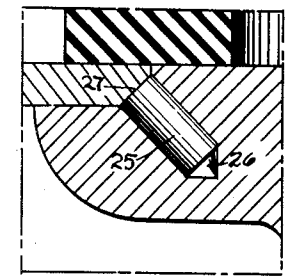


FIG. 2

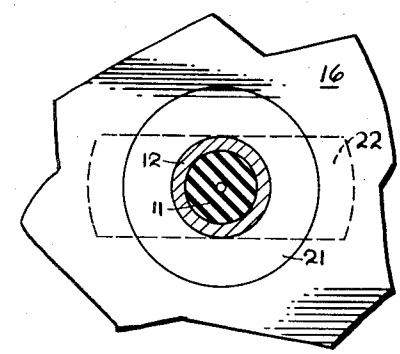


FIG. 3

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MOUNTING DEVICE FOR MOBILE ANTENNA

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4 Claims. (Cl. 174—153)

This invention relates in general to vehicular antennas, and relates more specifically to mountings therefor, particularly roof-top mountings.

An object of this invention is to provide a mounting device for antennas which will require a minimum size opening through the body panel.

Another object of this invention is to provide a panel mounting for antennas, which mounting may be inserted through an opening in the panel from the side opposite the antenna position, such as from the inside of a vehicle body, or may be inserted from the same side of the panel in what is termed a blind hole.

Still another object of this invention is to provide a mounting device which is sturdy and dependable.

Yet another object of this invention is to provide a mounting device which may be made with a minimum of special machinery or skilled labor.

And another object of this invention is to provide an anti-rotation anchor which becomes a superior ground connection by virtue of its mechanical function.

Other objects and a fuller understanding of the invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawing, in which:

Figure 1 is a sectional view of a complete antenna and mounting therefor, incorporating the preferred embodiment of the principles of this invention;

Figure 2 is an enlarged illustration of the portion of the mounting outlined by the boxed area of Figure 1, with the mechanical-electrical holding and grounding device added thereto; and

Figure 3 is a sectional view taken along line 3—3 of Figure 1 showing the disc and elongated bar nature of the anchor portion thereof.

In the drawings there is illustrated a preferred embodiment of the principles of this invention incorporated in a mounting member **10** for use with a roof-top antenna for passenger type automotive vehicles. The roof panel of the vehicle is indicated by the reference character **16**.

The illustrated embodiment of the mounting member **10** is provided with a threaded stud **11** extending above the panel **16**, anchor member **12** to engage the roof panel **16**, and in this particular embodiment, a tail piece **13** for extension into the interior of the body below the panel **16**.

In order to provide the absolute minimum opening requirement in the panel **16** and to provide a sturdy and dependable construction, the anchor member **12** is made with a locator disc **21** and a bar portion **22**. The bar portion **22** has an elongated configuration as best illustrated in Figure 3 of the drawings. The diameter of disc **21** determines the size opening to be provided in panel **16**. The disc **21** should fit snugly in the opening and thus serve as a locator for the mounting with respect to said opening to keep both ends of bar portion **22** engaged with the metal surrounding a hole provided through panel **16**. Of course, a full disc is not an absolute requirement because locating shoulders can serve such purpose. In

fact, the junction of disc **21** with bar portion **22** forms two spaced locating shoulders **23**. Therefore, the anchor member **12** serves as a cross bar. This anchor member cross bar has a stepped upper surface adjacent the threaded stud **11** to provide a locating portion residing within the opening cut in panel **16** and an anchor portion flaring out below the panel **16**. The disc **21** provides the stepped upper surface in the illustrated embodiment. In effect, anchor member **12** has a first and a second end with a first and second locating shoulder **23** set back from the first and second end respectively and these locating shoulders **23** are spaced apart with respect to one another a distance equal to the size of the opening provided in the panel **16**. As illustrated in the drawing, the shoulders **23** are provided by the stepped top surface. Because of the elongated nature of the bar portion **22**, it is possible to install this improved mounting in a blind hole and yet the mounting is equally as useful for installation by insertion of the stud **11** through an opening in the panel **16** from the side opposite the antenna position.

To install the anchor member **12** from the exterior, one or the other of the bar ends is inserted through the hole in panel **16** at a considerable angle and the entire end moved under panel **16** until the edge of the hole cut therein and the stud **11** come into contact. In such position, the opposite end of the anchor member can drop downwardly through the hole. Thereafter, the anchor member **12** is leveled with respect to panel **16** and the shoulders **23** move upwardly into the opening into the position illustrated in Figure 1 of the drawing. Installation from the interior requires only moving the mounting into position with the stud **11** extending through the opening.

Once installed as thus described and illustrated, there remains only the necessity for clamping the anchor and the panel securely together. In the illustrated embodiment of the invention, this function is accomplished by providing a weather seal packing **17**, a compression washer **18**, and a pressure producing nut **19** engageable with the threads of stud **11**. The nut **19** serves as one means to pull the anchor portion with a constant force and thereby hold the first and second ends of the anchor member **12** in tight engagement with the panel.

As illustrated in Figure 1, the stud **11** projects above the nut **19** and accordingly serves as a means for anchoring a whip type roof antenna **39** or other electrical device, if desired.

As thus described, the mechanical means of connecting an antenna has been set forth. However, modern automobile production methods quite generally provide for a rather thick, tar-like coating on the inner sides of the body panels. It has been found that fastening devices of relatively large size with sharp pointed teeth are frequently unable to cut through this coating and into the metal of the car body proper for the purpose of forming a ground connection for the antenna. Usually, such condition is caused by the body of such an anchor embedding into the coating material and forming a cushion which prevents such teeth from reaching and piercing the metal for good electrical connection.

A feature of this invention is the anti-rotation and electrical connection shown in Figure 2. This feature provides a mechanical means to hold the previously described anchor member against rotation while the nut **19**, or other threaded type clamp means, is employed to tighten the anchor portion to the panel **16**. After having served the purpose of a mechanical anchor, it then serves as an electrical connection for the antenna to ground. The electrical connection is actually improved by the mechanical action during the installation.

It has been found that the most practical anti-rotation

and electrical connector is a projection to contact the edge of the hole cut through the panel and to gouge or flatten a contact spot. If the piece were to be of cast metal rather than a mechanically formed piece, a small button area at one shoulder 23 will serve as an anti-rotation and electrical connector. However, machining has been preferred as the method of manufacturing these mountings. Therefore, the projection can be provided by drilling a socket 26 into the anchor member 12 at the junction of the shoulder 23 and top surface of one end of the anchor member. A pin member 25 having an end 27, is then inserted into the socket and permitted to project therefrom. Thus, the end 27 will dig into the panel 16 as the nut 19 draws the anchor 12 upwardly into tight engagement. The socket 26 is located to cause the end 27 to contact the freshly cut side walls which define the opening through panel 16. Therefore, regardless of the thickness of the undercoat on panel 16, end 27 will always engage into a fresh cut metal surface which surface is not covered with a protective agent and has not had sufficient time to become rusted or corroded. It is understood, of course, that the use of the pin 25 is the preferred method of causing such dual function anchor and that projecting edges integral with anchor 12 and other suitable modifications of the basic concept may be resorted to for similar mechanical and electrical function.

Although the invention has been described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and the scope of the invention as hereinafter claimed.

What is claimed is:

1. An antenna and mounting for automotive vehicles, comprising, a mounting device including a stud member and a tail piece member axially aligned and having a common passageway longitudinally therethrough, an anchor means located intermediate said stud member and tail piece member adapted to secure said mounting device in an opening through a panel with the stud member projecting on one side thereof and the tail piece member on the other side, said anchor means including a disc, the size of said disc determining the opening size to be provided in the panel, said disc therefor interfitting said opening and serving as locating means for said mounting device, an elongated bar on the tail piece side of said disc, said elongated bar being longer than the diameter of said disc and thereby providing projecting interference anchor ends to engage one side of the panel, means carried by said stud member to engage the panel member on the side opposite said elongated bar and grip the panel to secure the mounting device, a coaxial cable secured to said tail piece, said coaxial cable having a central conductor member passing through said common passageway to a terminal accessible at the end of said stud member, and antenna means secured to said stud and electrically connected to said terminal, whereby said mounting may be inserted into a blind hole with a toggle action, or inserted through an opening from the side opposite the position of the antenna.

2. An antenna and mounting for automotive vehicles, comprising, a mounting device including a stud member and a tail piece member axially aligned, an anchor means located intermediate said stud member and tail piece member adapted to secure said mounting device in an opening through a panel with the stud member projecting on one side thereof and the tail piece member on the other side, said anchor means including a disc, the size of said disc determining the opening size to be provided in the panel, said disc therefor interfitting said opening and serving as locating means for said mounting device, an elongated bar on the tail piece side of said disc, said elongated bar being longer than the diameter of said disc and thereby providing projecting interference anchor ends to engage one side of the panel, means carried by said stud member to engage the panel member on the side opposite said elongated bar and grip the panel to secure the mounting device, and antenna means secured to said stud, whereby said mounting may be inserted into a blind hole with a toggle action, or inserted through an opening from the side opposite the position of the antenna.

3. An antenna and mounting for automotive vehicles, comprising, a mounting device including a stud member and a tail piece member axially aligned, an anchor means located intermediate said stud member and tail piece member adapted to secure said mounting device in an opening through a panel with the stud member projecting on one side thereof and the tail piece member on the other side, said anchor means including a disc, the size of said disc determining the opening size to be provided in the panel, said disc therefore interfitting said opening and serving as locating means for said mounting device, an elongated bar on the tail piece side of said disc, said elongated bar being longer than the diameter of said disc and thereby providing projecting interference anchor ends to engage one side of the panel, means carried by said stud member to engage the panel member on the side opposite said elongated bar and grip the panel to secure the mounting device, localized projecting means extending from said disc in a position to contact the cut edge of an opening through the panel and thereby dig into such edge as the mounting is tightened upon the panel, and antenna means secured to said stud, whereby said mounting may be inserted into a blind hole with a toggle action, or inserted through an opening from the side opposite the position of the antenna.

4. An electrical and mechanical mounting for electrical devices such as antennas on relatively thin sheet metal panel members such as automobile car bodies comprising, a stud portion and cross bar anchor member in "T" formation, said cross bar member having first and second ends, a top surface surrounding the stud portion with said top surface consisting of a first and second anchor surface at the first and second end area respectively of said bar and a central surface plateau therebetween, said stud portion located centrally of said plateau, a first and second shoulder between the anchor surfaces and said central surface plateau, said first and second shoulder spaced a predetermined distance to correspond to the diameter of a hole cut in a panel to receive the mounting, means coacting between the stud and the cross bar to draw the surface surrounding said stud into a hole in the panel and clamping said mounting in the panel hole with a grip action, whereby said mounting may be inserted into a blind hole with a toggle action, or inserted through an opening from the side opposite the position of the electrical device, and electrical conductive means carried by said anchor member, said electrical conductive means being an angular drilled hole between the first locating shoulder and the first anchoring surface with a plug in said hole, said plug having a butt end, said butt end bridging across the angle formed by the first shoulder and the first anchor surface and said butt end of the plug therefore being positioned to bite into a hole cut into the panel to receive the mounting.

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