Dec. 21, 1954 J. L. STEWART 2,697,785

ANTENNA MOUNTING

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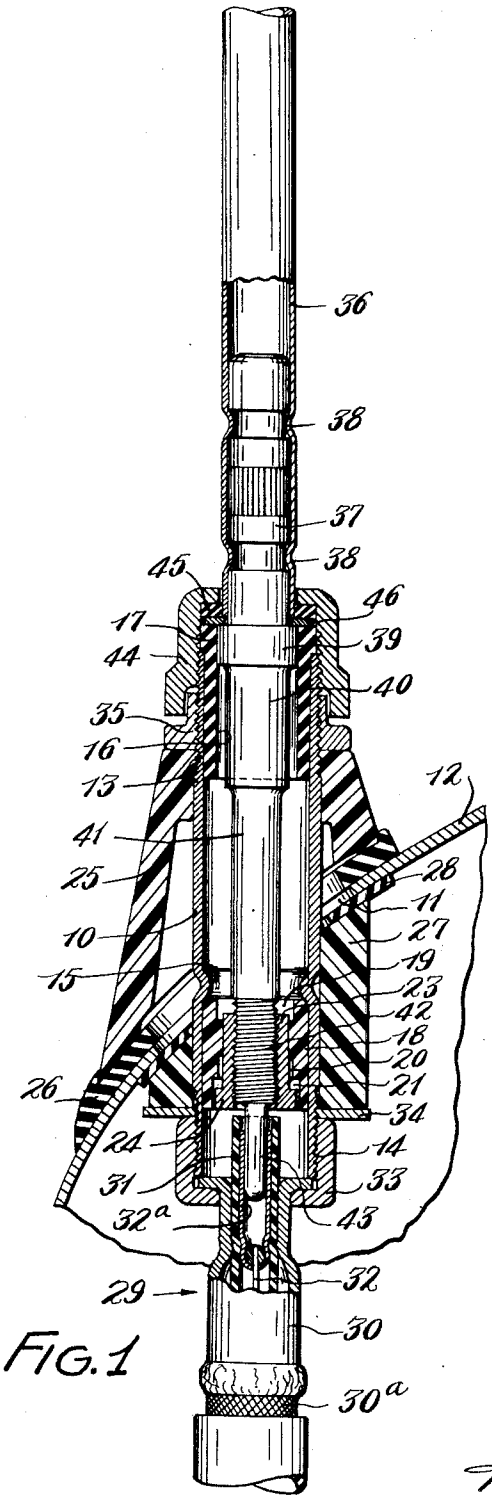


FIG. 1

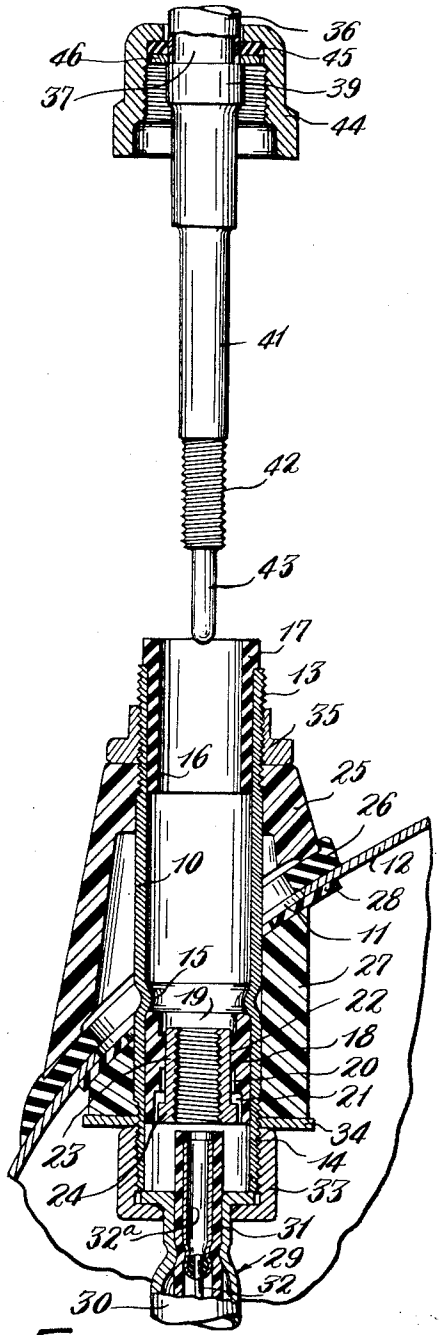


FIG. 2

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ANTENNA MOUNTING

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This invention relates to an antenna mounting such as a mounting for an automobile antenna, particularly one that is mounted on the cowl, fender or other locations of the automobile which have straight, sloping or curved panels as the support for the mounting.

Antenna mountings of the type hereinbefore referred to usually include a short sleeve member in which is mounted an insulating bushing in turn mounting a threaded sleeve and into which threaded sleeve the antenna rod screws. In these mountings the nuts for clamping the outer and inner mounting members against the outer and inner sides of the panel and for maintaining the assembled relationship of the parts of the mounting are screwed on the threaded portion of the antenna rod. The result in such an arrangement is that when the nuts are screwed to clamping position to maintain the mounting assembled the strain or force set up to hold the mounting members firmly against the outer and inner sides of the panel is transmitted directly to the threaded sleeve and insulating bushing in the relatively short sleeve. This strain or force acting through the antenna rod on the threaded sleeve and insulating bushing frequently causes the threaded sleeve to be pulled out of the insulating bushing or the insulating bushing to be pulled out of the relatively short sleeve of the construction.

Another disadvantage in these antenna mountings lies in the fact that in order to remove the antenna rod the clamping nut which holds the mounting members in assembled position upon the panel must be loosened with the result that the mounting assembly becomes disassembled.

An object of the present invention is to provide an antenna mounting wherein the clamping nut for the mounting assembly exerts no strain or force through the antenna rod upon the threaded sleeve and insulating bushing in the mounting sleeve, thereby obviating danger of the threaded sleeve pulling out of the insulating bushing or the latter pulling out of the mounting sleeve.

A further object of the invention is to provide an antenna mounting wherein the clamping forces which hold the mounting members on the panel of the automobile in clamped assembled relationship are not imparted to any part of the mounting through the antenna rod.

A still further object of the invention is to provide an antenna mounting such that the antenna rod can be removed from the mounting or secured therein without disturbing the clamped assembly of the mounting parts on the panel of the automobile.

A still further object of the invention is to provide an antenna mounting wherein the antenna rod is completely insulated from the parts of the mounting, wherefore the mounting, and particularly the outer and inner mounting members, if desired can be formed of metal parts, except those parts which insulate the antenna rod from the remainder of the mounting assembly.

Another object of the invention is to provide an antenna mounting which is so constructed that various types of inner and outer mounting members adapted to the curvature of the panel can be employed.

A still further object of the invention is to provide an antenna mounting which is simple in construction, can be readily manufactured and easily assembled.

Further and additional objects and advantages inherent in the invention and not specifically recited above will become apparent during the detailed description of an embodiment of the invention which is to follow.

Referring to the accompanying drawing illustrating such embodiment of the invention—

Fig. 1 shows the antenna mounting in longitudinal section and with the antenna rod assembled in the mounting, the antenna rod and the lead-in cable connector assembly being shown partly in longitudinal section and partly in elevation, and

Fig. 2 is a view similar to Fig. 1 but shows the antenna rod removed from the mounting assembly.

The embodiment of the invention illustrated in the drawing shows an antenna mounting comprising a metal mounting sleeve **10** which is of substantial length such that when it is passed through the opening **11** in the panel **12** of the automobile on which the antenna mounting is assembled the sleeve extends well beyond the outer and inner surfaces of the panel **12**. It will be understood that the panel **12** may be a cowl panel, a fender or some other part of the automobile.

The mounting sleeve **10** at its upper or outer and its lower or inner ends is externally threaded as indicated at **13** and **14**. The sleeve **10** intermediate its ends is provided with an internally projecting annular bead **15** for a purpose later to be explained. Fitted into the upper or outer end of the sleeve **10** with a tight fit therein is an outer insulating bushing **16** provided at its outer end with a thickened portion or flange **17** which overlies and engages the outer end of the sleeve **10**. The sleeve **10** also has tightly fitted therein a lower insulating bushing **18**, the upper end of which engages the internal bead **15** which acts to positively prevent any upward movement of the lower insulating bushing **18** within the sleeve **10**.

The lower or inner insulating bushing **18** intermediate its ends is provided with an axial bore communicating adjacent the upper end of the bushing with a counterbore **19** and also communicating at its lower end with a counterbore **20** which in turn communicates with a larger counterbore **21** adjacent the lower end of the lower insulating bushing **18** and providing a stop shoulder within the bushing. The axial bore in the lower insulating bushing **18** provides therein what may be termed an internal annular rib as indicated at **22**.

An internally threaded metal sleeve **23** is mounted in the lower insulating bushing **18** and the external diameter of the sleeve **23** is such that it has a pressed or tight fit within the internal annular rib **22** of the bushing **18**. The internally threaded sleeve **23** at its lower end has an external annular flange **24** located in the counterbore **21** of the lower insulating bushing and which flange will engage the stop shoulder formed by the counterbore **21** to prevent the threaded sleeve being pulled upwardly and out of the lower insulating bushing **18**.

The outer or upper mounting member and the inner or lower mounting member of the assembly may take various forms suitable for use on a curved panel or a straight panel and, if desired, may be formed entirely of metal, entirely of rubber or plastic material, or of a combination of metal and rubber or plastic materials. These mounting members may take the form illustrated in the drawing or they may have the form of the mounting members shown in the Finke et al. Patent 2,470,693, issued May 17, 1949, or they may be of any other suitable form.

The outer or upper mounting member **25** is illustrated as formed of hard rubber and it has its lower side curved or shaped to conform substantially to the curve or configuration of the upper surface of the panel **12**. The mounting member **25** at its upper end is provided with a bore through which the mounting sleeve **10** extends with a fairly snug fit which is to better exclude moisture and dirt. The sleeve **10**, except for its contact with the member **25** in the bore referred to, is spaced inwardly from the interior of the member **25**. The outer mounting member **25** preferably seats at its inner end in a complementary recess formed in a soft rubber gasket **26** which engages the outer side of the panel **12** as will be well understood in the art.

The inner or lower mounting member is indicated at **27** and is arranged beneath the panel **12** and is formed in this instance of hard rubber or plastic. The inner member **27** snugly fits the sleeve **10** and has its upper end shaped to conform substantially to the contour of the underside of the panel **12**, a soft rubber gasket **28** being interposed between the underside of the panel **12** and the upper end of the lower mounting member **27**.

A lead-in cable connector assembly designated generally at **29** and including an outer sleeve **30**, an insulating sleeve **31** and an inner radio frequency conductor **32** is secured to the externally threaded lower end **14** of the mounting sleeve **10** by means of a securing nut **33** which engages flanges on the sleeve **30** in a manner well understood in the art. The sleeve **30** is connected by soldering to a sheath **30***a*. A contact socket **32***a* is connected by soldering to the end of conductor **32** and extends to adjacent the end of the insulating sleeve **31**. A washer **34** is interposed between the nut **33** and the lower end of the inner or lower mounting member **27** as clearly indicated in the drawing and abuts the said member **27**.

The antenna mounting thus far described is mounted on the panel **12** by positioning on the mounting sleeve **10** the inner or lower mounting member **27**, the washer **34**, the nut **33** and the lead-in connector assembly **29**, after which the sleeve **10** is passed upwardly through the opening **11** in the panel **12** until the gasket **28** engages the underside of the panel. Then the gasket **26** and the upper or outer mounting member **25** are positioned on the mounting sleeve **10**, whereupon the entire assembly may be drawn into tight clamped and assembled position on the panel by the clamping nut **35**, which is screwed onto the threaded outer end **13** of the mounting sleeve **10** and has a flange which engages the outer end of the outer mounting member **25**.

When the antenna mounting assembly has been thus secured in position on the panel **12** in clamping engagement with the panel, its assembled relationship need not be disturbed in order to mount the antenna rod therein or to remove the antenna rod therefrom and thus a decided advantage over the usual antenna mounting is obtained by the mounting of the present invention.

The antenna rod is shown for purposes of illustration only as comprising a tubular portion **36** which may be in the form of a single elongated tube or may be made up of a plurality of telescoping tube sections if the antenna is of the extensible and retractable type. The tube portion **36** of the antenna has mounted in its lower end a solid antenna rod **37** which may be secured in the tube portion **36** by any suitable means such as by clamping the tube portion inwardly into annular channels formed in the rod **37** as indicated at **38**.

The antenna rod **37** is provided with a cylindrical portion **39** of greater external diameter than the remainder of the rod and which portion **39** will have a snug fit in the outer insulating bushing **16** carried by the mounting sleeve **10**. The antenna rod **37** below the cylindrical portion **39** has a reduced portion **40** of less external diameter than the internal diameter of the bushing **16**, wherefore there will be clearance between the portion **40** of the rod and the interior of the bushing when the antenna rod is secured in the antenna mounting.

Below the portion **40** the antenna rod has a still further reduced diameter portion **41** and below said portion **41** the rod has a threaded portion **42** which screws into the internally threaded metal connecting sleeve **23** which is carried by the lower insulating bushing **18** within the mounting sleeve **10**. The extreme lower end of the rod **37** and below the threaded portion **42** has a connecting jack portion **43** which when the antenna rod is assembled in the mounting extends into the insulating sleeve **31** and the contact socket **32***a* and is tightly gripped by the socket **32***a* to form an electrical contact therewith.

A cap nut **44** functions in addition to the threaded connection between the threaded portion **42** and the metal connecting sleeve **23** to connect the antenna rod to the mounting sleeve **10**. This cap nut **44** can rotate relative to the antenna rod when screwed down upon the external threads **13** at the outer end of the mounting sleeve **10** and acts through an operative connection between the closed end of the cap nut **44** and the cylindrical portion **39** of the antenna rod to apply locking friction to the threads of the rod portion **42** and the connecting sleeve **23**. The closed end of the cap nut **44** mounts an insulating gasket or washer **45** which has a sliding fit on the tubular portion **36** of the antenna.

Intermediate the washer **45** and the shoulder formed by the portion **39** of the antenna rod there is a metal flange or washer **46** which may be an integral out-turned flange portion of the tube **36** or may be a separate washer. The washer **46** does not contact the interior of the cap nut **44**.

Assuming that the antenna mounting has been assembled and clamped in position in the panel **12** as shown in Fig. 2, the antenna rod can then be inserted through the insulating bushing **16** until the threaded portion **42** of the rod reaches the metal connecting sleeve **23**, whereupon rotation of the rod will cause the threaded portion **42** to screw into the sleeve **23** as indicated in Fig. 1, with the connecting end jack portion **43** of the rod engaging the socket **32***a* of the lead-in connector assembly. At this time the enlarged cylindrical portion **39** of the rod is tightly engaging the interior of the insulating bushing **16** adjacent the outer end of the latter and it will be noted that the rod is adequately supported at axially spaced points, i. e., at the cylindrical portion **39** and the threaded portion **42** against lateral vibrational movements. Also at this time the rod is firmly, mechanically and electrically connected to the antenna mounting and to the conductor **32**. However, in order to put locking friction on the threaded connection between the threaded portion **42** of the rod and the sleeve **23** the cap nut **44** is screwed downwardly on the mounting sleeve **10** until the washer **46** is in firm or tight engagement with the outer end of the flange portion **17** of the insulating sleeve **16**. Thus is obviated likelihood of undesired loosening rotation of the antenna rod because of vibration or other factors, wherefore the threaded connection between the portion **42** of the rod and the sleeve **23** is not disturbed. Also when the cap nut **44** has been screwed down in the manner just referred to it functions to seal the antenna mounting against the entrance of dirt and moisture and imparts to the same a finished appearance.

It will be clearly seen that should the antenna become bent or otherwise injured or should it be desirable for any reason whatsoever to remove the rod from the mounting this can be done without disturbing the assembled and clamped relationship of the mounting by merely backing off the cap nut **44** and then rotating the antenna rod to unscrew the same from the sleeve **23**. It will be observed also that the clamping nut **35** transmits no force or strain to the bushing **18** and connecting sleeve **23** and thus is avoided any tendency of the bushing and sleeve **23** to be pulled from the mounting sleeve **10** by the antenna rod.

The antenna rod is completely insulated from the mounting sleeve **10** by virtue of the insulating bushing **16** which it engages and by reason of the fact that the connecting sleeve **23** is supported solely by the insulating bushing **18** while at all other locations the antenna rod is substantially spaced from and out of contact with the mounting sleeve **10**. Consequently the outer and inner mounting members and the other external parts of the assembly can be formed of metal, if desired, as they have no function of insulating the antenna rod from the panel **12**.

Although a preferred embodiment of the invention has been illustrated and described herein it will be understood that the invention is susceptible of various modifications and adaptations within the scope of the appended claims.

Having thus described my invention, I claim:

1. In combination, an antenna mounting and an antenna rod secured therein, said mounting comprising an elongated mounting sleeve adapted to extend through an opening in the panel of an automobile to which the mounting is secured, outer and inner mounting members on said sleeve to bear against the opposite sides of the panel, means on the inner end of said sleeve and engaging said inner mounting member to retain the member on the sleeve, said sleeve being exteriorly threaded adjacent its outer end, a clamping nut on the threaded outer end of said sleeve and engageable with said outer mounting member to draw said mounting members into clamping engagement with the panel and to maintain said members and mounting sleeve in assembled mounted relation on the panel, said mounting sleeve being provided internally with threaded means, said antenna rod extending into said mounting sleeve from the outer end thereof and having a threaded portion screwed into said threaded means to connect the antenna rod to the mounting independently of the clamping nut and free from the clamping forces exerted thereby.

2. The combination defined in claim 1 and wherein the threaded means internally of the mounting sleeve comprises an insulating bushing secured in said mounting sleeve and an internally threaded connecting sleeve secured in said bushing.

3. The combination defined in claim 2 and wherein said antenna rod rotatably mounts a cap nut screwed upon the outer end of the mounting sleeve outwardly of the

clamping nut, said antenna rod being provided with an external shoulder against which said cap nut acts to impart locking friction to the threads of the threaded portion of the rod and the connecting sleeve.

4. An antenna mounting as defined in claim 2 and wherein said bushing and connecting sleeve are adjacent the inner end of the mounting sleeve while a second insulating bushing is mounted internally of the mounting sleeve adjacent the outer end thereof, said rod having a portion of such diameter as to snugly fit within said second bushing while said rod intermediate said last mentioned portion and the threaded portion thereof is of such

diameter as to be spaced from the interior of the mounting sleeve and said second bushing.

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