

July 9, 1946.

H. A. BRYERS

2,403,479

ANTENNA MOUNTING

Filed July 1, 1944

2 Sheets-Sheet 1

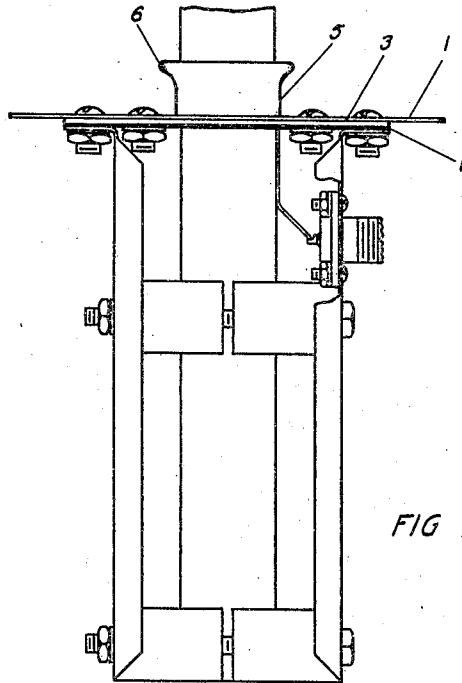


FIG 1

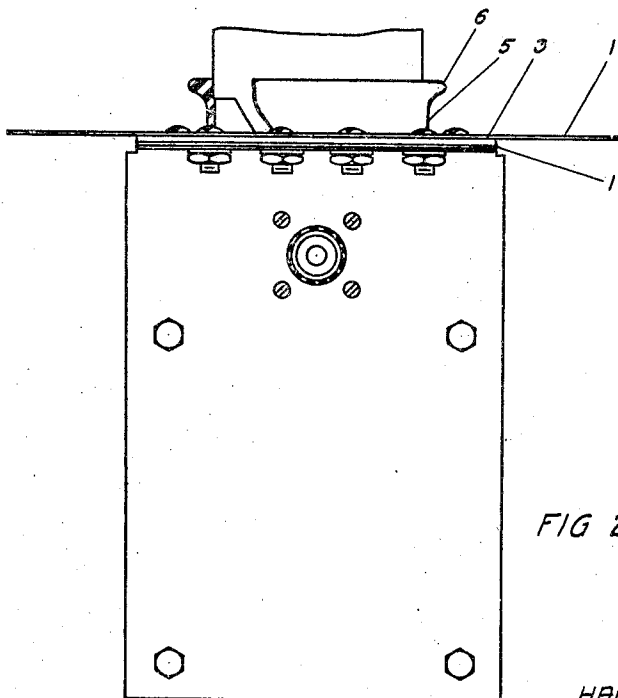


FIG 2

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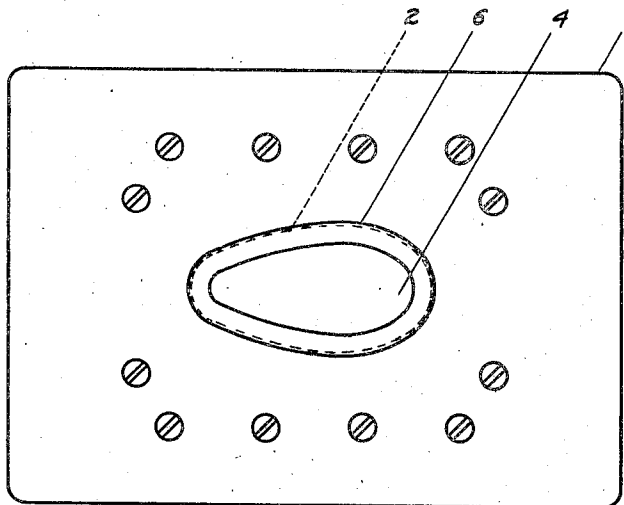


FIG 3

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ANTENNA MOUNTING

Harvey A. Bryers, Dayton, Ohio

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4 Claims. (Cl. 174—151)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

The invention to be hereinafter described relates to aircraft antenna mountings.

Mountings of stub antennas in the skin of a plane present various well known difficulties. It is difficult to pass the antenna through the skin, sufficiently spaced to prevent short circuiting or, at least, to prevent reducing highest electrical efficiency, while, at the same time, presenting an opportunity for an adequate weather seal. On the other hand, where an adequate weather seal is provided as by a gasket, it has been found that a mast opening of the dimensions regularly used, is inadequate to afford maximum electrical characteristics. Furthermore an opening of such size, with gasket, makes it possible to form a deposit on the gasket completely bridging the gasket from the skin to the mast, with resulting short circuiting.

The present invention has been developed to completely avoid the above and other objections and provide a simple, compact and efficient device whereby the mounting will be completely weather-proof, proof against short circuiting and so disposed as to maintain maximum efficiency of electrical characteristics of the antenna.

In order to more clearly disclose the construction, operation and use of the invention, reference should be had to the accompanying drawings forming part of the present application.

Throughout the several figures of the drawings, like reference characters designate the same parts in the different views.

In the drawings:

Fig. 1 is a side elevation of the invention, applied, partly broken away;

Fig. 2 is a right hand side elevation of Fig. 1, partly broken away, and

Fig. 3 is a top plan view of Fig. 2, with antenna omitted.

The type of antenna referred to is approximately oval or egg shaped in lateral cross section. So, the opening for it, logically, is of the same configuration. As a practical constructional application of the invention, removable plates 1 are provided to be bolted to the skin of the plane. In the present instance, two such plates 2 are used, provided with identical oval openings 2 adapted, in operative position, to be exactly aligned. In assembled position, they are bolted to the skin of the plane and also bolted to antenna supporting brackets which are secured to the

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plane for support. The skin of the plane is, of course, provided with a corresponding opening, to the edges of which plates 1 are secured.

By extensive experiments it has been definitely established that the distance between the antenna and the surrounding edge of the opening through the plates 1 must be held within proven limits. If this distance is appreciably departed from—i. e., if the distance is greater than the maximum or less than the minimum, the electrical characteristics of the antenna will be less than of maximum efficiency. On thorough and extensive tests a distance of one half inch has been found to produce highly satisfactory results, with the antenna operating at substantially maximum efficiency. Between plates 1 is securely clamped a sheet 3 of rubber or rubberized material provided with an oval opening 4 of the same outline as openings 2 through plates 1. In assembled relation, the openings 2 and 4 are approximately concentric, but an important difference is that, whereas, the openings 2 are of appreciably greater size than the corresponding cross section of the antenna, the opening 4 is appreciably less than that cross section. The preferred proportions are about one half inch less in diameter for opening 4 than the corresponding cross section of the antenna A. While rubber has been mentioned as the material of plate 3, it will be understood that other suitable materials may be used.

Extending upwardly from opening 4 or in the direction of the length of the antenna and, therefore, parallel with the antenna, in assembled relation, is a collar or sleeve 5 of considerable height, terminating in a relatively large, thick peripheral bead 6. Bead 6, it will be noticed, lies at the outside of the collar edge. This presents a smooth straight continuous face the full height of the collar 5, so that the collar 5, throughout its entire extent may be in continuous and approximately uniform contact with the antenna.

Plates 1 with sheet 2, sandwiched between, are secured to the antenna mounting brackets, with the opening 4 and surrounding collar 5 properly concentrically positioned in aligned openings 2. This provides a space of about one half inch between the metal sheath of the antenna and the surrounding edge of the aluminum plate, when the antenna is in position. This sandwich assembly of plates and grommet is slipped down over the end of the antenna to the final desired position, the rubber sleeve 5 stretching radially to accommodate the greater diameter of the antenna. Thus, in final assembled position, the grommet extends from the edge of openings 2 to

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the antenna, completely closing that gap against weather as well as otherwise. Collar 5, extending lengthwise of the antenna, is stretched to an elastic, close fitting, continuous contact throughout its entire area. By making the collar one half inch in length and providing the outwardly rolled bead 6 around its upper edge, it has been found that the conducting coat of deposit otherwise formed is prevented, so that by such a grommet the danger of short circuiting encountered with the previously used type of gasket seal is effectively prevented. The increased radial span between the plate edge and antenna, the increased length of sleeve along the antenna and the outward roll of the bead, all contribute to this result.

It is believed that the construction, operation and use of the invention will be clear from the preceding detailed description.

Changes may be made in the construction, arrangement and disposition of various parts of the invention, within the scope of the appended claims, without departing from the field of the invention and it is meant to include all such within this application wherein only a preferred form of the invention has been disclosed by way of illustration and with no intention to limit the claims thereby.

Having thus described my invention what I claim and desire to protect by Letters Patent is:

1. In combination in a mounting for stub antennas, a pair of attaching plates provided with aligned antenna openings therethrough of appreciably greater area than and similar contour to the corresponding cross-sectional area of a stub antenna with which said mounting is to be used and a sheet of insulating material clamped between said plates and extending inwardly beyond the edges of said openings, said sheet having an elastic area extending adjacent said openings and being provided with an opening therethrough substantially concentric with and of similar contour to said openings through said plates and of appreciably less area than the cross-sectional area of a stub antenna with which said mounting is to be used, whereby, in assembled relation, said sheet closely and elastically fits said stub antenna.

2. In combination in a mounting for stub antennas, a pair of attaching plates provided with aligned antenna openings therethrough of appreciably greater area than and similar contour to the corresponding cross-sectional area of a stub antenna with which said mounting is to be used and a sheet of insulating material clamped between said plates and extending inwardly beyond the edges of said openings, said sheet having an elastic area adjacent said openings and being provided with an opening therethrough substantially concentric with and of similar contour to said openings through said plates and of appreciably

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less area than the cross-sectional area of the aforesaid stub antenna whereby, in assembled relation, said sheet closely and elastically fits said stub antenna, said sheet being provided with an elastic bead coextensive with the opening through said sheet and directed diametrically outwardly relatively to the opening through said sheet.

3. In combination in a mounting for stub antennas, a pair of attaching plates provided with aligned antenna openings therethrough of appreciably greater area than and similar contour to the corresponding cross-sectional area of a stub antenna with which said mounting is to be used and a sheet of insulating material clamped between said plates and extending inwardly beyond the edges of said openings, said sheet having an elastic area extending adjacent said openings and being provided with an opening therethrough substantially concentric with and of similar contour to said openings through said plates and of appreciably less area than the cross-sectional area of a stub antenna with which said mounting is to be used, whereby, in assembled relation, said sheet closely and elastically fits said stub antenna, the aforesaid elastic area being continued from the edge of the opening therethrough perpendicularly outwardly therefrom in the form of an elastic collar of appreciable length and of a configuration adapted to snugly elastically fit about an antenna with which the mounting is adapted to be used.

4. In combination in a mounting for stub antennas, a pair of attaching plates provided with aligned antenna openings therethrough of appreciably greater area than and similar contour to the corresponding cross-sectional area of a stub antenna with which said mounting is to be used, and a sheet of insulating material clamped between said plates and extending inwardly beyond the edges of said openings, said sheet having an elastic area extending adjacent said openings and being provided with an opening therethrough substantially concentric with and of similar contour to said openings through said plates and of appreciably less area than the cross-sectional area of a stub antenna with which said mounting is to be used, whereby, in assembled relation, said sheet closely and elastically fits said stub antenna, the aforesaid elastic area being continued from the edge of the opening therethrough perpendicularly outwardly therefrom in the form of an elastic collar of appreciable length and of a configuration adapted to snugly elastically fit about an antenna with which the mounting is to be used, said collar having a circumferential bead extending diametrically outwardly from the free edge thereof in a plane approximately parallel with that of the body of the sheet.

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