UNITED STATES PATENT OFFICE

2,444,941

QUICK-CHANGE RADIO ANTENNA MOUNT

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Application August 11, 1944; Serial No. 549,989.

4 Claims. (Cl. 248—43)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 U.S. 575)

1. 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 antenna mounting and more particularly to a quick-change antenna mounting.

In mounting antennas in the skin of an airplane, one common practice has been to first mount them in an antenna supporting or mounting disc, plate or the like and then mount that disc in a sleeve, cup or other anchoring support secured in the skin of the plane, suitable spring cushioning or shock absorbing devices being interposed to adequately protect the assembly, as a whole, if complicated, involves a number of parts and provides no way for removal and replacement of the antenna; selectively, from either side or direction. By that construction the antenna may be applied, removed or renewed from the one side only.

The present invention avoids the above and other objections and provides a simple, efficient, compact and quickly removable and replaceable antenna which may be, as desired, removed and replaced from either side of the plate and, therefore, from either the outside or the inside of a plane. It completely eliminates the cup or anchoring device secured directly to the plane skin and to which the disc is adapted to be coupled, and, along with it, the cushioning or shock absorbing devices between it and the disc.

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 drawing:

Fig. 1 is a side elevation, partly broken away, of an antenna with positioning block attached;

Fig. 2 is a side elevation of the mounting disc with sleeve;

Fig. 3 is a plan view of Fig. 2;

Fig. 4 is a plan view of Fig. 1, assembled in Fig. 2 with retaining cap nuts;

Fig. 5 is a fragmentary cross-section through one of the cap nuts;

Fig. 6 is a fragmentary side elevation similar to Fig. 1 showing the preferred positioning block and

Fig. 7 is a side elevation of the invention assembled showing the preferred mounting disc.

The drawing illustrates the invention as applied to a sleeve-type of antenna, as one type to which the invention is applicable. It is, as will be well understood, readily applicable to many other types of antennas, illustration of the one type being sufficient to amply disclose the invention.

In the preferred form of the invention, a disc, plate or like antenna mounting means, 1, is provided and adapted to be secured within the skin of a plane, as by bolts or like connecting means or devices. Various forms of connecting plates may be used such as rectangular, commonly used with stub antennas, circular, commonly used with sleeve-type antennas, etc. It is provided with a centrally disposed cylindrical sleeve or collar 2 extending continuously from both faces of plate 1. In this form, the tubular sleeve is smooth bored to slidably receive a coupling block 3 which is rigidly secured to the sleeve of a sleeve-type antenna, as by swaging, shrinking on, or otherwise suitably connecting it in a predetermined fixed position. Or this block 3, if desired, may be internally threaded to cooperate with threads on the sleeve and the adjustment of the block lengthwise of the sleeve, to predetermine the extent of projection of the antenna beyond the plate 1, may be made in the field at the time of final mounting of the antenna. Such adjustment may be made simply by traversing block 3 more or less along the screw threads of the sleeves.

In the present invention, at the plant where the antenna assembly or unit is produced, block 3 is properly positioned on the sleeve of the antenna to give the predetermined projection of the antenna, when finally assembled, for use on the skin of a plane, for instance. It is then rigidly secured on the sleeve of the antenna, against longitudinal movement. In substance, it becomes a fixed part of the antenna sleeve. Block 3 is of an exterior diameter substantially equal to the interior diameter of sleeve 2, so that, in assembled relation, block 3 fills the radial space between the antenna sleeve and sleeve 2.

It is of the same length as sleeve 2. In assembled relation, ready for operation, the ends of block 3, within sleeve 2, will lie flush and even with the ends of sleeve 2. This will properly locate the antenna so that it will project to the desired extent beyond the mounting plate 1. To secure the antenna in this adjusted position, threaded cap nuts 4, having radial flanges 5, are provided, one for each end of sleeve 2. By turning these cap nuts on, at each end, until their respective flanges 5 overlap and lie against the
flush ends of sleeve 2 and block 3, the block 3 may be positively and securely held within sleeve 2, with the antenna definitely positioned with the correct predetermined amount of projection.

By unscrewing either of the cap nuts 4 the antenna may be easily and quickly removed and a new one as quickly substituted.

A somewhat simpler and preferred form is shown in Figs. 6 and 7 where the cap nuts and threading on sleeve 2 are omitted. Instead, block 3 is provided with two short longitudinal notches 6 in longitudinal alignment, each extending from the respective end towards the opposite end of the block. Cooperating with these notches are corresponding set screws 7 in sleeve 2, longitudinally aligned. These screws are adapted to be seated in notches 6. The notches 6 are so proportioned and the cooperating set screws 7 are so placed in sleeve 2 that when both screws are turned in to the point where their ends extend into the notches 6, they will engage the end walls of the notches. Block 3 will then be locked in sleeve 2 with the ends of block 3 flush with the ends of sleeve 2, just as when the cap nuts 4 of the first embodiment are in position. The screw and notch arrangement is simple and quicker acting while being just as positive and fully as efficient. Obviously other suitable connections may be substituted. By backing out either set screw the antenna may be readily withdrawn through that end of the sleeve 2.

By either of the above constructions and arrangements the antenna with its block 3 may be easily and quickly removed from its mounting plate and another antenna, arranged or set for the proper projection, may be as quickly and easily substituted.

An outstanding characteristic of this invention is the fact that the antenna may be installed with equal ease, speed and certainty from either side of the plate. This is particularly desirable for use in planes as it enables ready application either outwardly through the plane skin from within or inwardly through the plane skin from without.

As shown in the drawing, the antenna is provided with the usual coaxial connector.

While a known type of sleeve antenna with which the invention may be readily used has been shown in the drawings it will be well understood that the invention may be used with various other types of antennas such as split-can, stub, whip, wire, etc.

In order to have the invention applicable it is only necessary that the mounting plate 1 shall have a centrally disposed opening therethrough of a configuration and size to closely receive the respective antenna and that means be provided for positively and removably securing within such opening the respective antenna in a definite predetermined position with freedom of selective withdrawal and renewal of the antenna through said opening in either direction along the axis of that opening.

It is thought 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 the 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 one preferred form and one modification have been illustrated, purely by way of example and with no thought or intention of, in any degree, limiting the invention thereby.

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

1. An antenna mounting comprising a plate provided with a tubular sleeve extending there-through and to an appreciable distance beyond either face thereof, an antenna having a cooperating block of substantially the same exterior dimensions as the interior dimensions of said tubular sleeve fixed to said antenna at a predetermined point longitudinally thereof, and means for securing said block wholly within said tubular sleeve.

2. An antenna mounting comprising a plate provided with a tubular sleeve extending there-through and to an appreciable distance beyond either face thereof, an antenna having a cooperating block of substantially the same exterior dimensions as the interior dimensions of said tubular sleeve and cap nuts carried by said sleeve and engaging said block and retaining it wholly within said sleeve while at the same time permitting removal and insertion thereof in either direction.

3. An antenna mounting comprising a plate provided with a tubular sleeve extending there-through and to an appreciable distance beyond either face thereof, an antenna having a cooperating block of substantially the same exterior dimensions as the interior dimensions of said tubular sleeve fixed to said antenna at a predetermined point longitudinally thereof, said block being provided with longitudinal locking notches and locking means cooperating with said notches to securely lock said block wholly within said tubular sleeve, the aforesaid notches and locking means permitting free removal and reinsertion of said antenna in either direction.

4. An antenna mounting comprising a plate provided with a tubular sleeve extending there-through and to an appreciable distance beyond either face thereof, an antenna having a cooperating block of substantially the same exterior dimensions as the interior dimensions of said tubular sleeve fixed to said antenna at a predetermined point longitudinally thereof, said block being provided with locking notches extending longitudinally inwardly from its opposite ends and locking means carried in the aforesaid sleeve in position to be aligned with said notches, said locking means being longitudinally spaced a distance approximately equal to the minimum longitudinal distance between the aforesaid said notches, said locking means cooperating with said notches to securely lock said block wholly within said tubular sleeve while permitting free removal and reinsertion of said antenna in either direction.

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