

[54] **MARINE ANTENNA MOUNT**

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[52] U.S. Cl. **248/42, 248/188.2, 403/84, 403/99**

[51] Int. Cl. **F16m 13/00**

[58] Field of Search **248/43, 44, 188.2; 52/116**

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Primary Examiner—William H. Schultz

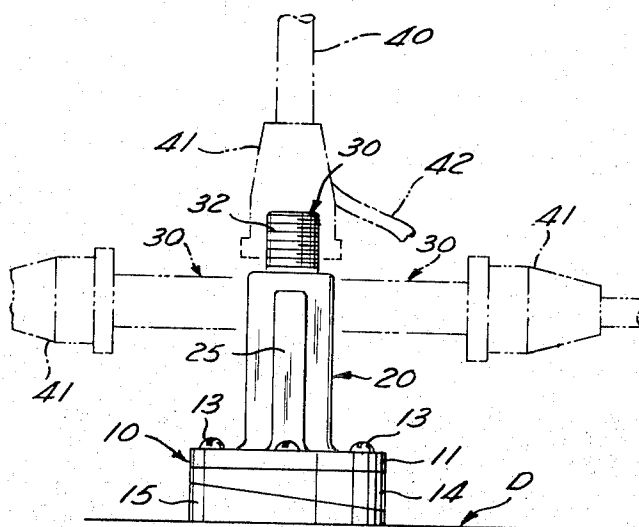
Attorney, Agent, or Firm—Ely & Golrick

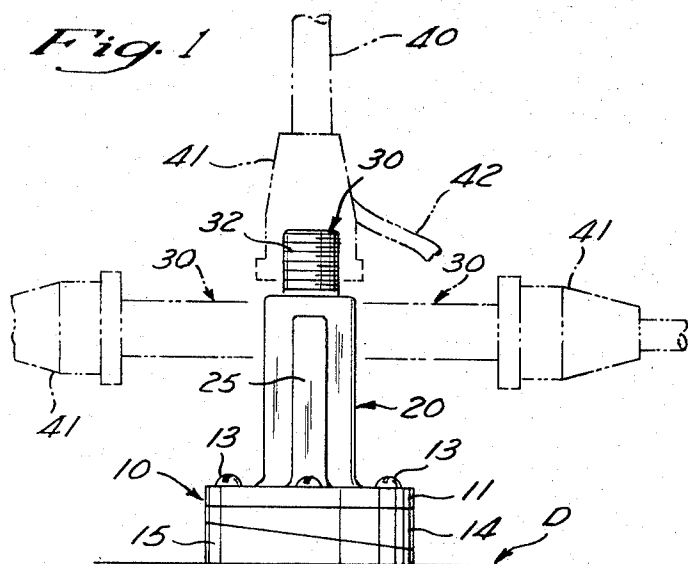
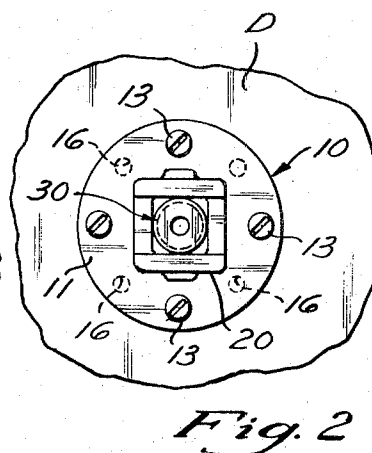
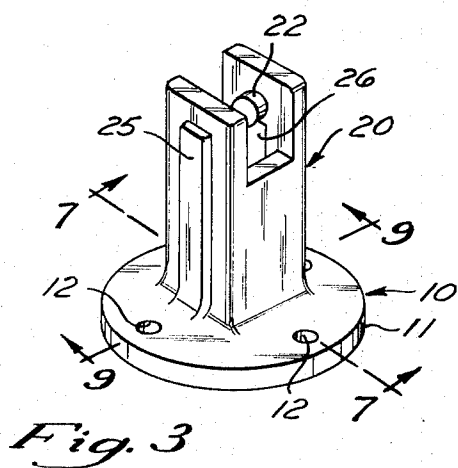
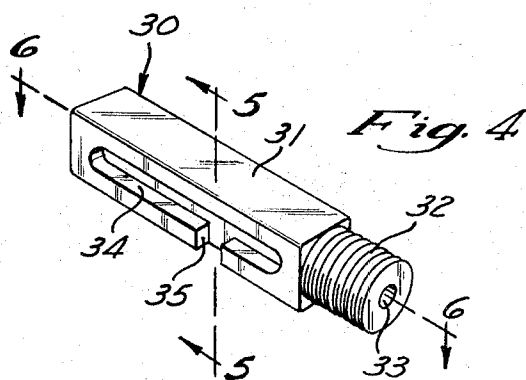
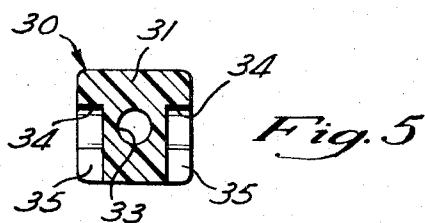
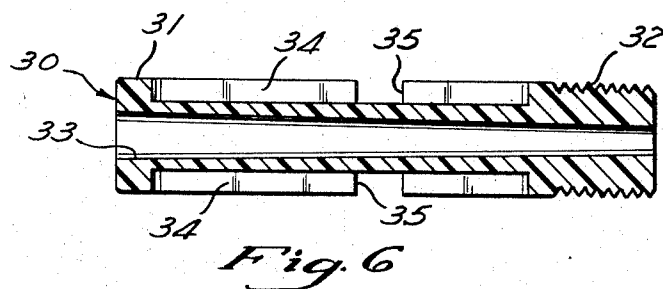
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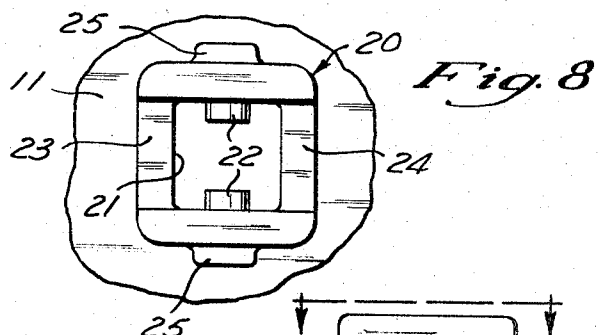
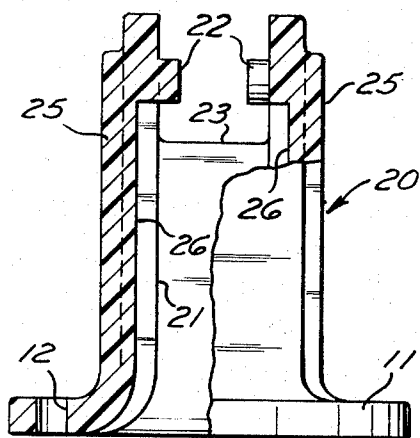
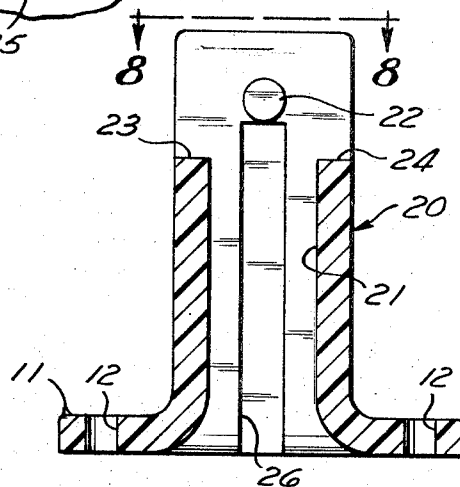
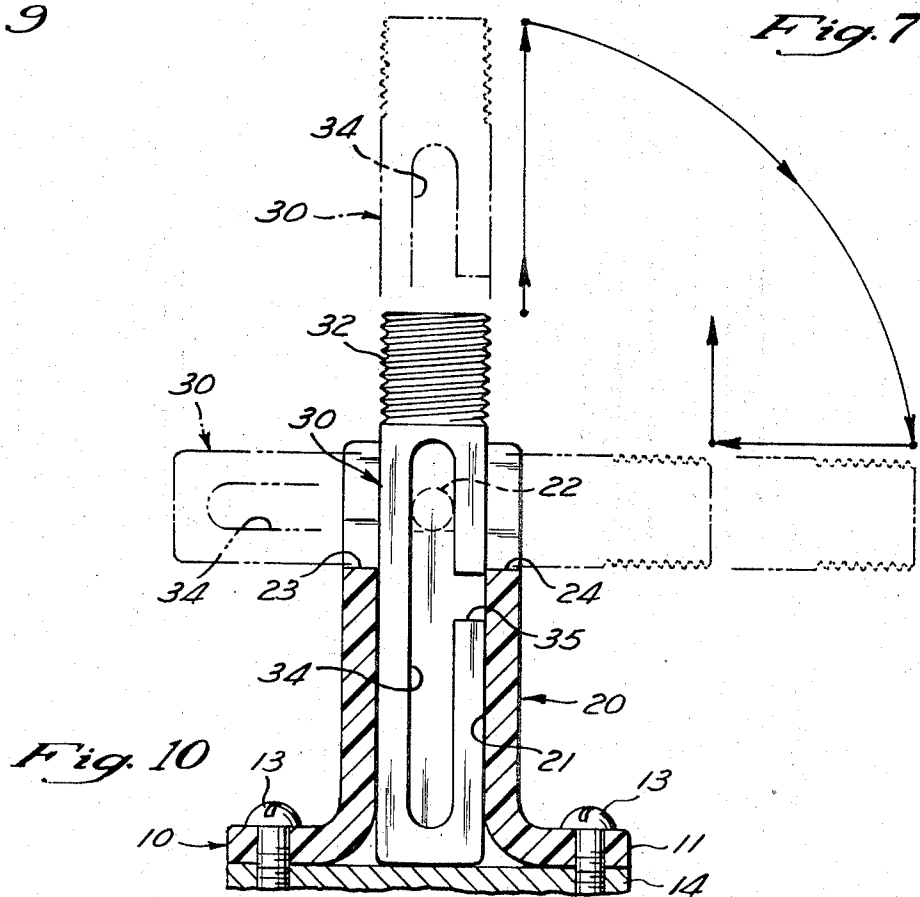
ABSTRACT

Marine antenna mount permits ready horizontal lay-down in fore or aft direction of antenna normally locked in vertical position by means of internal slidable block upon which antenna is secured. The block is provided with closed-end slots to receive pivot bosses carried in the base of the mount in the upper part of the passageway in which the block is slidable and normally locked by the weight of the antenna when vertical. Lifting of antenna to uppermost position permitted by the slots permits the antenna and block to be pivoted to a fore or aft laydown position. Transverse openings intermediate the closed ends of the slot permits the antenna and attached block, when shifted while in a laydown position, to be lifted off the pivot bosses and thereby readily removed for storage without dismounting the base. The base is mounted through a pair of cylindrical shims truncated in plane skew to end surfaces of the shims when arranged as a right cylinder; rotation of shims with respect to each other accommodates the base to the cant of the mounting surface of the boat (e.g., deck or cabin top).

6 Claims, 10 Drawing Figures







MARINE ANTENNA MOUNT

This invention relates to improvements in mounting means for antennas, particularly those intended to be used for the marine radio or like mobile communications. As a marine antenna mount, such an antenna may be quickly and readily laid down from the normal vertical position during use to a fore or aft position and also may be readily removed from the base of the mount for storage and/or safekeeping.

Satisfactory antennas for marine communication radios and the like are generally sturdy but flexible poles or whips, frequently of fiberglass or the like, carrying a lengthwise electrical conductor which serves as the actual antenna element for sending and/or receiving. Particularly for non-commercial powered pleasure craft, such an antenna structure usually extends well above any other super-structure of the boat and, thus, should be capable of being readily lowered to permit passage under low bridges or cross-walks over canals, locks, rivers, and mooring areas and also to permit entrance into and exit from boat houses where such storage facilities are available. It is also common practice to at least lower such antennas, and preferably remove them, when the boat is docked or moored or hauled out for repairs or off-season storage. In haul-outs the raised antennas interfere with the usual slings and cranes of the haul-out facilities and boat covers used for winter storage. If the boat must be trailered for any distance after haul-out, safety from overhead wiring dictates the antenna, which lowering is requisite for transportation over public highways. After docking or mooring, lowering the antenna is often recommended to reduce the fatigue and strains on the antenna itself and its mount and fastenings; such strains are imposed by wind loads and rocking of the boat during the vastly greater number of hours that the boat is docked or moored, compared with the time the boat is in use. Another very practical reason for lowering and preferably removing the antenna while the boat is docked or moored is that a raised antenna advertises the presence of valuable radio equipment inside the boat and thereby invites breaking and entering of the boat for theft of the radio and other equipment and gear; this can occur in relatively well-guarded marinas and is a very serious problem in lonelier or more poorly policed mooring areas and docks.

The mounts for marine antennas must be rugged and secure, since they serve as a fixed base support for a long, flexible columnar structure free at its upper end. Heretofore such mounts have usually secured the antennas to the base by means of ferrules or caps which must be unscrewed (or lifted and rotated if a bayonet lock rather than a threaded connection is employed) whenever the antenna has to be lowered or removed from the mount. This and the reverse operation when an antenna was to be raised or installed were time-consuming, particularly if the closely mating surfaces in the connection between the antenna and its mount were subject to corrosion or depositions of salt (or scale which may develop in fresh water operation). The frequent need and nuisance of having to use tools to lower or remove the antenna as well as to replace and/or secure the antenna in its raised position invited the skippers to risk striking overhead structure with a raised antenna and to leave it raised while the boat was docked or moored.

It is an object of this invention to provide a simple and rugged essentially two-piece structure that will support a relatively heavy marine antenna securely and yet permit the antenna to be readily lowered and removed from the deck or other supporting surface and equally readily replaced or raised; this may be accomplished without tools.

An antenna mount made according to this invention may be molded of tough, non-corrodable plastics which resist weathering and interference of relative motion between adjacent surfaces by salt or scale deposited by evaporation of the water to which the mount is exposed.

A feature and advantage of this invention is the provision of a shimming means permitting the mount to accommodate the cant of the deck or other supporting surface to which it is secured.

Other objects and advantages of this invention will be apparent from the following specification, claims, and drawings, in which:

FIG. 1 is an elevation of an assembled antenna mount made according to this invention, showing in phantom the normal vertical position of the antenna it carries, and, also in phantom, the alternate horizontal positions, usually fore or aft, to which the antenna may be lowered.

FIG. 2 is a top plan view of the mount shown in FIG. 1.

FIG. 3 is a perspective of the base member shown in FIG. 1.

FIG. 4 is a perspective of the internal sliding block member removed from its assembly with the base member, as shown in FIGS. 1 and 2.

FIG. 5 is a cross-section taken along the line 5—5 of FIG. 4.

FIG. 6 is a longitudinal section taken along the line 6—6 of FIG. 4.

FIG. 7 is a vertical section taken along the line 7—7 of FIG. 3.

FIG. 8 is a detail plan of the central column and socket of the base member taken from the line 8—8 of FIG. 7.

FIG. 9 is a fragmentary view of the base member, partly in elevation and partly in section taken along the line 9—9 of FIG. 3.

FIG. 10 is a vertical section of the base member similar to FIG. 7, but showing in elevation the internal sliding block assembled, as in FIGS. 1 and 2, and in phantom and by a directional arrow the movement of the internal block whereby it (and its attached antenna, not shown) may be removed from the base member.

Referring to the drawings showing an embodiment of a marine antenna mount made according to this invention, it comprises a base member 10 comprised of a base flange 11 having bolt holes 12 by which the member 10 may be secured to the deck D or like suitable supporting surface or members of the craft (or vehicle) such as, for example, a rigid cabin top, by means of the usual through-bolts 13 customarily employed in securing deck fittings. The base flange 10 is provided with a central upstanding column 20 adapted to support an antenna in its raised operating position to send and/or receive radio communications.

In order that the central column 20 may, for purposes of illustration, be shown in a vertical position, in FIG. 1 the deck D is shown as a horizontal plane and the base flange 11 is mounted parallel thereto. In actual

practice, the surface where the antenna is most conveniently mounted is usually canted (that is, it has a slant fore and aft and/or transversely of the craft). To accommodate this cant and/or allow the antenna to be mounted so that it will either be vertical when docked or provided with a forward rake offsetting the lifting of the bow and the aft bending of the antenna under the wind loads at normal cruising speeds (thereby providing the optimum vertical position of the antenna at those speeds), the base flange 11 is preferably bolted to the supporting surface D through a pair of mating shim pads 14 and 15. As shown in their assembled position in FIG. 1, these shim pads may be identical truncated cylindrical sections assembled so that they form a right-cylinder bisected by a plane at an angle to the parallel end surfaces of the shim pads. By rotating the pads with respect to each other, the pads provide a substantially cylindrical wedge having opposite surfaces variable from parallelism to an angle which is double the angle between the bisecting plane and the end surface of each pad. By then rotating the assembled shim pads 14 and 15 with respect to the base flange 11, the base flange can thereby be positioned at any desired angle, within the range of adjustment of the pads, to the supporting surface D.

To aid in locating the pads with respect to the base flange 11, the shim pads may optionally be provided with a number of holes 16 so that, by matching alternate holes 16 with each other and the holes 12 in the base flange 11 after the shim pads 14 and 15 have been rotated to provide the desired cylindrical wedge, the aligned sets of holes serve as guides for the drill bit by which holes for the through-bolts 13 may be drilled through the supporting surfaces D and allow the base member 10 to be mounted at the desired angle and position on the deck or supporting surface D. If the shim pads 14 and 15 are not provided with sets of preformed holes 16 which will match the flange holes 12, the flange holes 12 serve as guides for drilling through the pads and the surface D after the pads have been rotated to position the base 10 at the desired angle on the surface D.

The column 20 of the base 10 is provided with an internal socket or passageway 21 for receiving the block 30 of the antenna mount, said passageway preferably extending through the base flange 11, as shown in FIGS. 7 to 10. The upper portion of the passageway 21, at its sides normally located athwart the column 20, is provided with a pair of opposed pivot bosses 22. The normally fore and aft areas of the upper portion of the passageway are relieved by the notches 23 and 24 to a depth below the pivot bosses 22 sufficient to permit the lowering and removal of the block 30 and the antenna 40 carried thereby. To stiffen the sides of the column 20 which carry the pivot bosses 22, without increasing its massiveness, these sides are provided with external ribs 25 and correspondingly internal grooves 26. To reduce torque loads on the pivot bosses 22 when the antenna is raised, the normally horizontal cross-sections of both the passageway 21 and the block 30 slidably received therein with a relatively close fit are preferably polygonal, i.e., rectangular in the specific embodiment shown. The lower edge of the forward notch 23 is configured to receive the block 30 to allow it and the antenna it carries to be pivoted forwardly to a substantially horizontal position and the lower edge of the aft notch 24 is similarly configured to allow the block 30

and its antenna to be pivoted aft to a substantially horizontal position, indicated in phantom in FIG. 1.

The block 30, having a body 31 of a cross-section mating with the passageway 21 as above described, is provided at one longitudinal end with a threaded boss 32 for connection, relatively permanently, with an antenna 40 having a threaded connecting ferrule 41 carrying a conventional flexible lead-in 42. The body 31 may be hollow longitudinally, as shown in FIGS. 4-6 to reduce the volume of the plastic of which it is preferably molded without reducing its stiffness; this hollow center 33 is usually left by a die-pin used as an aid to precision molding (or casting, if made of metal) of the block 30.

Opposite sides of the block body 31 are provided with a pair of longitudinal closed-end slots 34 receiving and closely fitting with the pivot bosses 22. The slots 34 extend down the opposite side of the body 31 so that, with the pivot bosses 22 located in the normally lower ends of the slots, the lower end of the body 31 can pivot thereon, the fore and aft lower corners of the body 31 and/or the inner edges of the bottoms of the notches 23 and 24 being filleted or coved, if necessary, to provide clearance for such pivoting. When the block body 31 is vertically received in the passageway 21 so that the lower end of the body rests on the bottom of the passageway (i.e., the pad 14, as shown in FIG. 10), the upper ends of the slots 34 preferably clear the pivot bosses 22. Thus, with the antenna 40 raised, the pivot bosses 22 do not carry the weight of the antenna and transverse wind and inertia loads on the antenna 40 and block 30 are carried by the engagement of the sides of the block body 31 with the relatively closely fitting walls of the passageway 21 in the column 20 of the base 10.

One side of each slot 34, preferably the normally aft side, is provided with an opening 35 extending through to an unslotted side of the block body 31. The width of each opening 35 is preferably no greater than the diameter of a pivot boss as may be necessary to provide sliding clearance; the opening 35 is also preferably located toward the upper end of its slot 34, as indicated in FIG. 10, and may even be at the upper end of the slot 34.

As shown in FIGS. 1 and 10, and as above described, when the antenna 40, carried by the block 30, is in its normal raised position, the antenna's weight forces the block to the bottom of the passageway 21, where it is held against transverse loads of wind and inertia on the antenna. It is theoretically possible, during violent pitching of a boat in rough seas, for the antenna 40 and its attached block 30 to be thrown upwardly until the pivot bosses 22 strike the bottoms of slots 34 and the antenna can then be thrown forward or aft as the block pivots on the bosses 22, but in actual practice, the simultaneous transverse wind and inertia loads on the antenna 40 bind and pinch the block 30 in the passageway 21 and limit upward dislocation of the block due to pitching of the boat.

To lower the antenna to allow the boat to pass under a bridge, to pass under over-head wires while the boat is being trailered, etc., a continuous manual upward pull on the antenna, even while the boat is in a choppy sea, will lift the block 30 until the bosses 22 strike the bottoms of the slots 34, at which point the antenna 40 and block 30 may be pivoted to a fore or aft position, as shown in FIG. 1. If pivoted forward the block 30 remains locked between the bosses 22 and the lower

edges of the notches 23 and 24 regardless of any longitudinal shifting of the block with respect to the bosses. If pivoted aft, the inertia of the antenna with respect to the normal forward movement of the boat will practically always keep the bosses within the lower end (as viewed in FIG. 10) of the slots 34, similarly locking the antenna in its lowered position.

To remove the block 30 as shown in FIG. 10 and, thus, its attached antenna 40 for storage or safekeeping, the antenna is pulled upwardly until the pivot bosses 22 strike the lower ends of the slots 34 in the block 30 whereupon the antenna may be pivoted to its lowered aft position. By then pushing the block 30 horizontally forward while exerting an upward pull on it, the pivot bosses 22 will fall into the openings 35, whereupon the block 30 may be lifted out of the notches 23 and 24 and, thus, free of the base 10. The lead-in 42 may then be disconnected from the boat by releasing its conventional connector (not shown) connecting it to the radio equipment on the boat. The directional arrow in FIG. 10 indicates the movement of the block 30 whereby it may be readily removed from the fixed base 10. The reverse movement, of course, allows the detachable antenna and block to be readily re-installed in the base.

This invention is not to be understood to be limited to the specific embodiment disclosed but may be modified and varied by those skilled in the art without departing from the scope of this invention as set forth in the following appended claims. For example, the block 30 may even be cylindrical in its external surface, though this will impose on the pivot pin means a shear load which, in the preferred embodiment, is carried by the close fit of the block 30 in the passageway 21, both being of a mating square cross-section so as to resist any twisting of the antenna 40 about its vertical axis when raised; the same twist-resisting effect can be obtained when the mating cross-sections are of other polygonal or non-circular configurations. Likewise, instead of the opposed pivot bosses 22 fitting in the interrupted slots 34, the block 30 may be provided with a single interrupted slot extending through the block in which a single pivot pin extending across the passageway will be received; this modification may provide a stronger pivot means, but at the expense of a weaker and less rigid block structure. Still other and further variations within the scope of the appended claims may be found in commercial embodiments of this invention.

What is claimed is:

1. An antenna mount permitting ready shifting of an antenna between a relatively secure vertical position to a laydown position comprising a base member for mounting on a supporting surface, said base member having a wall portion defining a passageway serving as an upwardly opening internal socket when the base member is mounted on a relatively horizontal surface, transverse pivot means carried by said wall portion extending into said passageway adjacent the upper opening thereof, a block member longitudinally slotted to receive said pivot means and permit said block member to be slidably mounted in said passageway, means for connecting an antenna to said block member, said wall portion being provided with a first notch below the upper end thereof and located between the extension of said pivot means into said passageway, and the slot in said block extending toward the end of said block

opposite said antenna connecting means a distance sufficient to permit said end to clear the wall portion of said base opposite said notch as said block is pivoted into said notch to permit an antenna connected thereto to be lowered from a relatively vertical position, said block including an opening from the exterior thereof into said slot therein, said opening being of sufficient width to permit said block to be pulled clear of said pivot means, whereby said block and an antenna connected thereto can be readily removed from said base member without removal of the latter from the supporting surface on which it is mounted.

2. An antenna mount as defined in claim 1 in which at least a portion of said block has a non-circular cross-section which mates with the cross-section of a portion of said passageway when said block is slid to its lowermost position in said base member whereby the said mating portions of said block and passageway will resist twisting of said antenna when it is raised.

3. An antenna mount as defined in claim 1 in which the slot is closed at the end of the block, the base member is provided with a second notch opposite said first notch to permit said block and connected antenna to be lowered in a direction opposite that to which the block may be pivoted into said first notch, the depth of both the first and second notches being sufficient to permit the block to be slid on said pivot means when lowered into either notch, and the opening in said slot is located away from the closed end thereof whereby, to pull the block away from said base member, the block must be lowered into a notch so as to locate said opening below said pivot means and the block must be slid into the opposite notch to a position where said pivot means will pass through said opening as the block is lifted out of the upper opening of said passageway.

4. An antenna mount as defined in claim 3 in which said pivot means comprises a pair of opposed bosses integral with the wall portion of said base member, the total lengths of said bosses being less than the width of said passageway at the location of said bosses and the slot in said block is partitioned by a web so as to provide an opposed pair of slots receiving said pair of bosses, the thickness of said web not being greater than the difference between the lengths of said bosses and the said width of the passageway.

5. An antenna mount as defined in claim 4 in which said base member is provided with a flange extending radially outwardly of the lower end of the wall portion defining said passageway, said flange having openings permitting said base member to be secured to a supporting surface, and means to adjust the angle of the length of the said passageway to the slant, if any, of said surface.

6. An antenna mount as defined in claim 5 in which said adjusting means comprises a first wedge member having a planar surface contacting and at least coextensive with the lower surface of said flange and rotatable with respect thereto and an opposite wedge surface lying in a plane at an angle to said planar surface, a second wedge member having a planar surface adapted to bear on the supporting surface and an opposite angular wedge surface mating with the wedge surface of said first wedge member, said second wedge member being rotatable with respect to said first wedge member, whereby rotation of said wedge members with respect to each other and said flange permits the angle of said flange with respect to said supporting surface to be adjusted to a range of angles between the sum and the differences of the angles of the wedge surfaces of first and second wedge members to their respective planar surfaces.

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,819,136 Dated June 25, 1974

Inventor(s) Arthur A. Finke

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the cover page (page 1) of the above numbered patent, the following numbered section should have read as follows:

[73] Assignee: Orion Industries, Inc.

Signed and sealed this 12th day of November 1974.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents