Dec. 21, 1965 W. T. EVILLE ETAL 3,224,716

COLLAPSIBLE ANTENNA

Filed Dec. 28, 1961

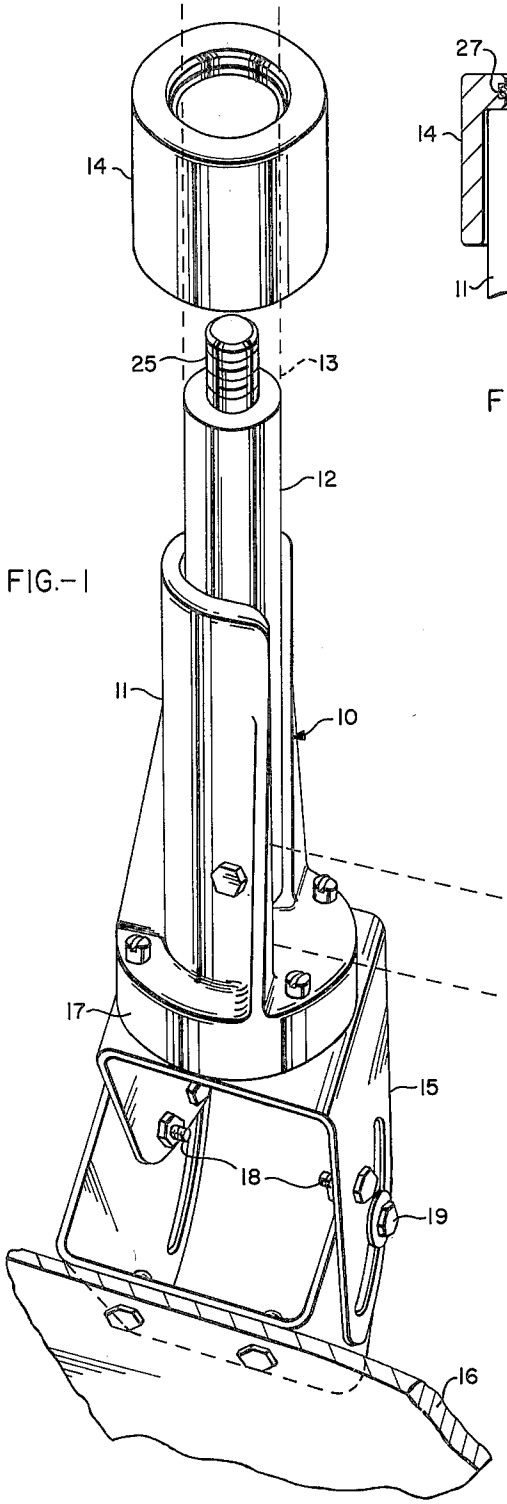

FIG.-1

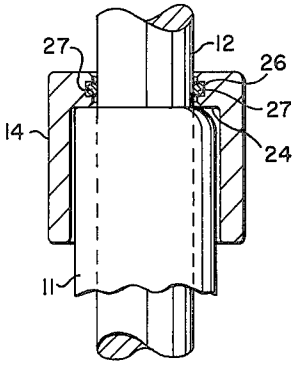

FIG.-3

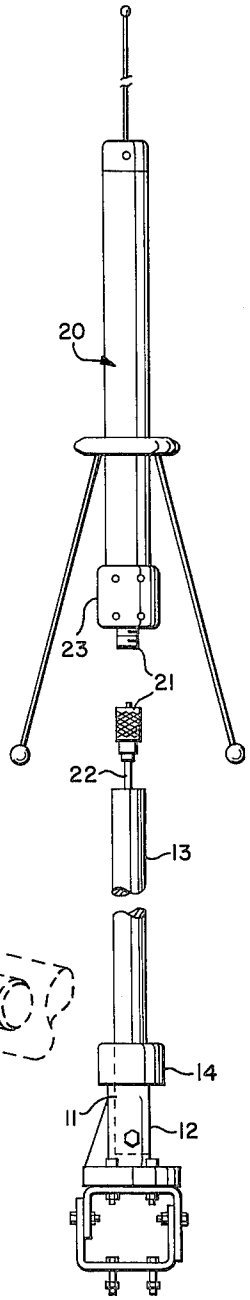

FIG.-2

INVENTOR.
WILLIAM T. EVILLE
ARTHUR A. FINKE

BY Watts & Finke

ATTORNEY

United States Patent Office 3,224,716 Patented Dec. 21, 1965

3,224,716

COLLAPSIBLE ANTENNA

William T. Eville, Painesville, and Arthur A. Finke, Newbury, Ohio, assignors to Antenna Specialists Co.

Filed Dec. 28, 1961, Ser. No. 162,890
10 Claims. (Cl. 248—43)

This invention relates in general to antennas, and relates more specifically to the mounting structure therefor.

The invention is particularly applicable to the mobile communication whip antennas carried by boats and other sea-going vessels. When these antennas are in their signal-receiving position, they are too tall to pass under the bridges, tree limbs and other low-hanging structures often encountered.

It is desirable, therefore, that the antenna be provided with a mounting structure which will permit the antenna to be readily lowered to a clearance position and then quickly raised to an operating position after the boat has passed under a low obstacle. Such a mounting structure should not require the antenna to be disconnected or dismantled each time it is lowered.

This invention provides a special antenna mounting structure which permits the antenna to be lowered to clear low hanging obstacles. The entire operation of releasing the antenna from its normally upright operating position, lowering it to a clearance position, and raising it back to the operating position may be performed quickly, easily, and without any danger of being fouled midway.

The prior art devices for lowering mobile communication antennas are completely unsatisfactory for use on sea-going vessels. Most are not rugged enough to withstand the rough treatment of the sea. Many will accidentally release the antenna from its operating position. Others comprise many complicated parts and become inoperative when subject to corrosion such as that caused by sea spray. No prior art device has the simplicity of operation and yet the ruggedness and dependability which characterizes the invention.

Accordingly, an object of this invention is to provide an antenna mounting structure and release mechanism which will permit the antenna to be lowered to a clearance or storage position.

Another object of this invention is to provide a mounting structure and release mechanism wherein the antenna may be released from its operating position by hand and without the use of any tools.

Still another object of this invention is to provide a mounting structure and release mechanism wherein the antenna cannot accidentally release from its operating position.

A further object of this invention is to provide a mounting structure and release mechanism which is rugged and dependable.

Yet another object of this invention is to provide a mounting structure and release mechanism having a minimum number of parts so as to be economically manufactured.

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 drawings, in which:

FIGURE 1 is a detail perspective view of the mounting structure of this invention;

FIGURE 2 is a foreshortened elevational view of a complete antenna assembly employing the mounting structure of this invention; and

FIGURE 3 is a detail view, partially in cross section, of the antenna locking mechanism of the mounting structure of the invention.

Referring now to the drawings and particularly to FIGURE 1 an antenna universal mounting assembly is indicated generally by the reference character **10**. The mounting assembly **10** comprises a pedestal **11** and an antenna base **12** pivotally mounted within the pedestal **11**. An antenna support tube **13** (shown in phantom in FIGURE 1) is removably secured to a threaded stud **25** protruding from the end of antenna base **12**. A locking ring **14** is provided to lock the antenna base **12** to the top of the pedestal **11**. An adjustable mounting bracket **15** is provided to mount the pedestal to a surface **16**.

The pedestal **11** may be described as semi-tubular in shape in that it is defined by an arcuate wall having a longitudinal slot about as wide as the inside diameter of the wall. Preferably, when in use, the semi-tubular portion of the pedestal is mounted in the vertical position with the slot toward the stern of the boat. A mounting flange **17** at the bottom of the semi-tubular portion of pedestal **11** is secured to mounting bracket **15**.

The antenna base **12** is a rod having its bottom end pivotally secured within the semi-tubular portion of pedestal **11** at a point near mounting flange **17**. The antenna base **12** may be angularly rotated between a signal-receiving position, axially coextensive with the pedestal, and a lay-down position, approximately horizontal, where it extends out of the slot of pedestal **11**. The lay-down position of antenna base **12** is shown in phantom in FIGURE 1.

The locking ring **14** is shown in cross section in FIGURE 3 exposing an inward shoulder **24**. To lock the antenna base the locking ring **14** is slipped down over the nearly circular top of the pedestal **11** until the shoulder **24** of locking ring **14** seats against the top of the pedestal. In this position the locking ring circumscribes both the antenna base **12** and the pedestal **11** thereby rigidly locking the antenna base in the operating or signal-receiving position.

The inward shoulder **24** of the locking ring **14** is provided with a circumferential groove **26** in which is seated a non-metallic friction ring **27**. Ring **27** frictionally engages the surface of antenna base **12** to prevent accidental disengagement of locking ring **14** from pedestal **11** during sudden violent motions of the surface to which the mounting assembly **10** is attached. The degree of grip of friction ring **27** on antenna base **12** is such to prevent undesired disengagement of locking ring **14** from pedestal **11** while allowing locking ring **14** to be moved at the will of the operator.

When it is necessary to release the antenna from its operating position, for storage or to clear a low-hanging object, locking ring **14** is lifted until it clears the top of pedestal **11**. Antenna base **12** with the antenna attached may then be angularly rotated to the clearance position shown in phantom by the drawing.

As thus far described, an antenna mounted on the threaded stud **25** of the antenna base **12** may be quickly released from its operating position and caused to lay down to a clearance position. However, not all surfaces are suitable for mounting the pedestal in a vertical position and thus an adjustable bracket **15** is provided to mount the antenna on any surface, be it horizontal, vertical, or sloping.

The mounting bracket **15** is shown as mounting the pedestal **11** to sloping surface **16** of a boat. The bracket comprises two identical U-shaped members. The two U-shaped members are secured together by turning the legs of each U-shaped member in towards the base of the other member and securing them in an overlapping manner by means of bolts **18**. The back of each U-shaped member provides a mounting surface. The back of the first U-shaped member is secured to the mounting

flange 17. The back of the second U-shaped member is secured to surface 16. Having thus secured pedestal 11 to surface 16 by means of mounting bracket 15, pedestal 11 is placed in a vertical position by rotating it, together with its U-shaped member, about the axis determined by the bolts 18. The pedestal is then securely fastened in the vertical position by tightening lock bolts 19.

An antenna assembly utilizing the invention is shown in FIGURE 2. The antenna is shown generally at 20 in its signal-receiving position. Antenna 20 is secured to the top of antenna support tube 13 by means of support sleeve 23. Antenna support tube 13 is secured to the threaded stud 25 (shown in FIGURE 1) of antenna base 12. Antenna 20 is electrically connected to communication equipment aboard the boat by means of connector assembly 21 and conductor 22. Locking ring 14 is shown in its locking position where it clips antenna base 12 to pedestal 11.

Although the specification describes the invention in detail it is believed to comprise essentially a pedestal, an antenna operatively mounted on the pedestal and movable between a clearance or storage position and an operating or signal-receiving position and a locking and release mechanism including a clip member rigidly securing the antenna in its operating position to the pedestal. The invention also provides an adjustable mounting bracket for supporting the antenna mounting assembly on surfaces of any inclination with respect to the operating position of the antenna.

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. A communication antenna mount comprising, a pedestal, said pedestal including and having a tubular wall portion defining a vertically extending space adapted to receive an antenna base and having a vertically extending slot opening into said space, an antenna base, said antenna base including an elongated portion pivotally mounted within said pedestal and movable between an antenna signal-receiving position in which said antenna base extends vertically in said space and an antenna storage position in which said antenna base extends through said slot, and a locking and release mechanism including a movable sleeve member, said sleeve member circumferentially engaging the outside surface of said antenna base and movable from a position clear of said pedestal wall to a position engaging said pedestal wall and closing said slot to rigidly secure the antenna base to said pedestal in the signal-receiving position.

2. A mobile communication antenna mount comprising, a pedestal, said pedestal including an arcuate wall having a longitudinal slot substantially as wide as the inside diameter of said wall, an antenna base, said antenna base including an elongated portion having means for mounting an antenna, means pivotally mounting one end of said elongated portion within said arcuate wall, said antenna base being angularly rotatable between an operating position axially coextensive with said arcuate wall and a clearance position wherein said elongated portion extends out through the slot, and a locking and release mechanism, said locking and release mechanism including a sleeve member, said sleeve member in the lock position encircling said pedestal and said antenna base and thereby holding said antenna base locked within said pedestal and said sleeve member in the release position encompassing only said antenna base.

3. A mobile communication antenna mount comprising, a pedestal, said pedestal including an upstanding mounting and supporting wall means, an antenna base, said antenna base including an elongated portion having means for mounting an antenna, said elongated portion being mounted within said mounting and supporting wall means and being movable between an antenna signal-receiving position and an antenna clearance position, and a locking and release mechanism, said locking and release mechanism including a sleeve member, said sleeve member being mounted for translational movement axially of said antenna base, said sleeve member in the antenna locked position circumferentially encircling said elongated portion and said upstanding wall means when said antenna base is in the signal-receiving position and said sleeve member having an antenna released position free of said upstanding wall means whereby said antenna base is movable to an antenna clearance position.

4. A mobile communication antenna mount comprising, a pedestal, said pedestal including an upstanding arcuate wall and a mounting flange protruding from the bottom of the arcuate wall, said arcuate wall having a longitudinal slot substantially as wide as the interior diameter of said arcuate wall, an antenna base, said antenna base having an elongated portion, one end of said elongated portion being pivotally secured within said arcuate wall near said mounting flange, said antenna base being angularly rotatable between an axially coextensive antenna signal-receiving position and an antenna clearance position where said elongated portion extends out of said entrance opening, a locking and release mechanism, said locking and release mechanism including a ring member slidably carried by said antenna base between an antenna locked and an antenna released position, and said ring member being movable to the antenna locked position when said antenna base is in the axially coextensive position and said ring member in the locked position circumferentially encircles the top outside surface of said arcuate wall to rigidly secure the antenna base in the signal-receiving position.

5. An adjustable mounting bracket comprising a first and second identical U-shaped bracket member, each bracket member comprising a back portion and a first and second leg member extending from the ends of said back portion, the legs of said first bracket member turned towards and overlapping the legs of said second bracket member and pivotally secured thereto, arcuate hole means in the first leg member of each of said U-shaped bracket members and locking means disposed therein and removably secured to the adjacent leg member of the other of said bracket members, the back of said first U-shaped bracket adapted for mounting an antenna thereto, the back of said second U-shaped bracket member adaptable for mounting to a supporting surface, the back of said first bracket member angularly rotatable with respect to the back of said second bracket member whereby an antenna mounted on the back of said first bracket may be pivoted to and locked in a vertical position when the back of said second bracket is mounted on supporting surfaces whose slope may vary between and include a horizontal position and a vertical postion.

6. A communication antenna mount comprising a pedestal, antenna base, said antenna base including an elongated portion mounted to said pedestal and movable between an antenna signal-receiving position and an antenna storage position, a locking and release mechanism including a movable sleeve member, said sleeve member circumferentially engaging the outside surface of said antenna base and said pedestal to rigidly secure the antenna base to said pedestal in the signal-receiving position, and an adjustable mounting bracket for mounting said pedestal to a supporting surface, the adjustable mounting bracket including a first and second identical U-shaped bracket member, each said bracket member comprising a back portion and a first and second leg member extending from the ends of said back portion, the legs of said first bracket member turned towards and overlapping the legs of said second bracket member and pivotally secured

thereto, arcuate hole means in the first leg member of each of said U-shaped bracket members and a locking bolt disposed therein and removably secured to the adjacent leg member of the other of said bracket members, said pedestal mounted to the back of said first U-shaped bracket member, the back of said second U-shaped bracket member being adaptable for mounting to a supporting surface, and the back of said first U-shaped bracket member being angularly rotatable with respect to the back of said second bracket member whereby the antenna may be placed in a vertical operating position when said back of said second bracket member is mounted to a supporting surface having a slope variable between and including a vertical position and a horizontal position.

7. The combination of claim **4** wherein said locking and release mechanism includes a friction ring carried by said ring member to frictionally engage said antenna base so that said ring member cannot be accidentaly disengaged from the antenna locked position.

8. A mount for or a communication antenna permitting the antenna to be lowered from a substantially vertical position to a substantially horizontal position comprising a pedestal having a normally vertical tubular portion, a longitudinal slot extending downwardly from the upper end of said tubular portion, an antenna base normally mounted within said tubular portion and having a width sufficiently less than said slot to permit said base to be moved with clearance through said slot, a pivot extending through said tube and said base transversely to said base to permit said base to be pivoted through said slot, and a sleeve having an inner shoulder slidably supporting said sleeve for longitudinal movement on said

base to a position clearing the normally upper end of said tubular portion, said sleeve having an internal bore sufficient to permit said sleeve to be slid over said tubular portion, and said inner shoulder, when said sleeve is slid over said tubular portion, being located to abut against the top edge of said tubular portion, whereby, when said sleeve is slid on said base to clear said tubular portion, said base may be pivoted through said slot and, when said base is axially aligned in said tubular portion, said sleeve may be slid over said tubular portion and said base will be supported and locked against accidental displacement within said tubular portion by said pivot and said sleeve.

9. The mount as defined in claim **8** including means to hold said sleeve in said locking position.

10. The mount as defined in claim **9** in which said holding means is friction means located within said sleeve to restrain sliding movement along said base.

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CLAUDE A. LE ROY, *Primary Examiner.*

HERMAN K. SAALBACH, *Examiner.*