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[54] **ANTENNA MOUNT**

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[51] **Int. Cl.²** **H01Q 1/08**

[58] **Field of Search** 52/110; 343/713, 888

[56] **References Cited**

UNITED STATES PATENTS

2,301,397	11/1942	Hacker	52/110
2,321,272	6/1943	Becwar	52/110 X
2,536,733	1/1951	Finke et al.	52/110

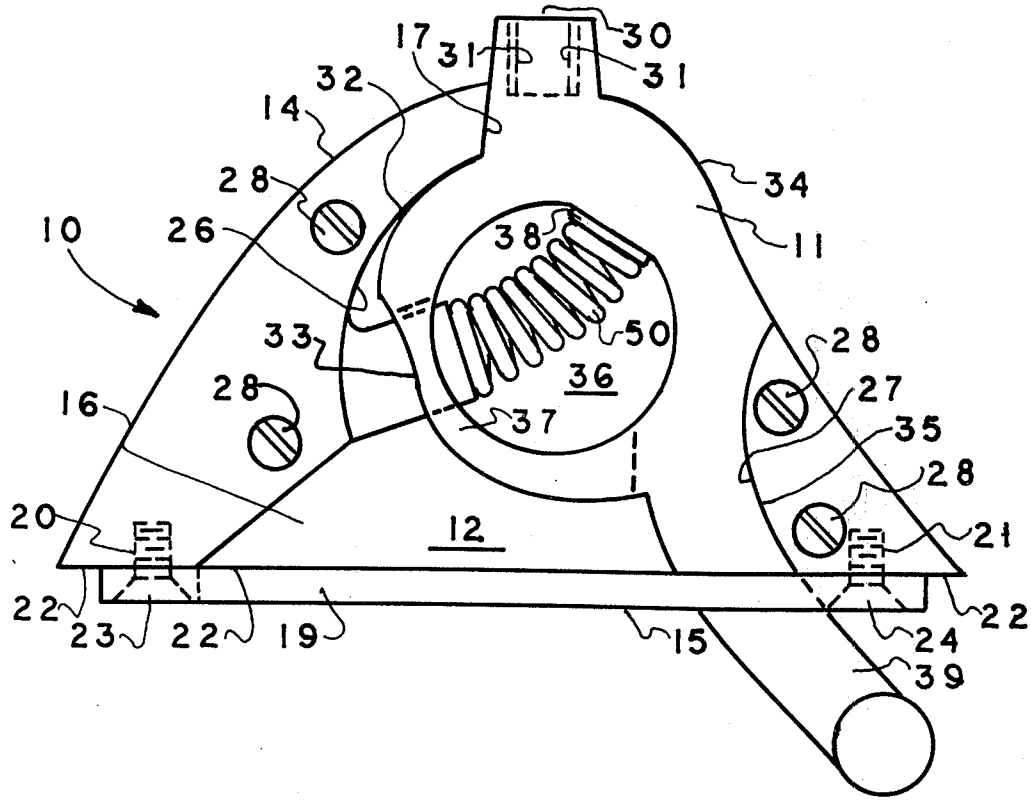
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[57] **ABSTRACT**

The disclosure relates to an antenna mount apparatus of the type which mounts an antenna onto a vehicle. The antenna mount apparatus includes a base member having a bottom adapted for being secured to a vehicle and a cavity having walls defining cam surfaces. The antenna mount also includes a pivotable member within the cavity. The pivotable member includes a receptacle for receiving an antenna to be mounted and peripheral cam surfaces that co-act with the base cam surfaces so that when in a first position, the antenna apparatus is semi-locked with the antenna disposed in a vertical position and when in a second position the antenna mount is locked with the antenna disposed in an acute position extending towards the rear of the vehicle. Because the mount is semi-locked in the first position, should the antenna strike an overhanging obstruction during vehicle movement, the impact will cause the mount to assume the second position so that the impact will be diminished leaving the antenna undamaged and lowered for clearing further low overhanging objects.

9 Claims, 3 Drawing Figures



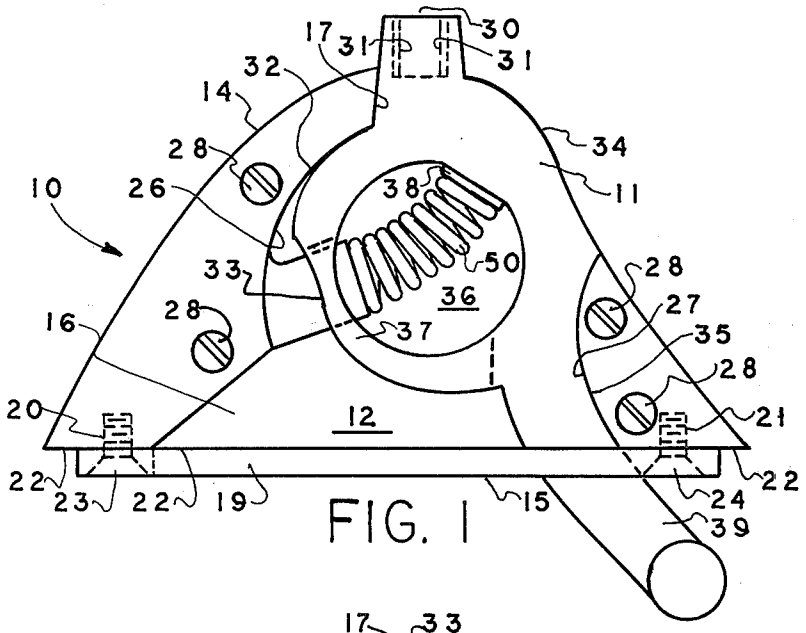


FIG. 1

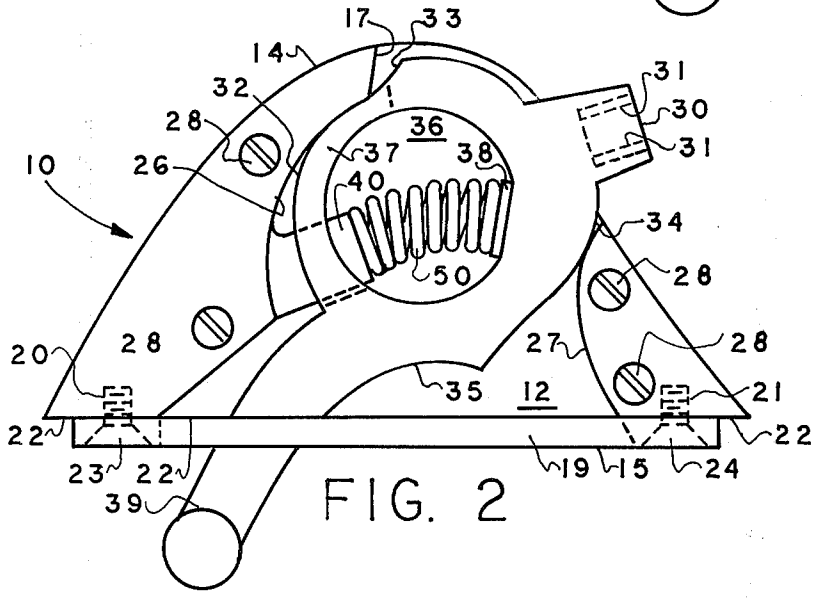


FIG. 2

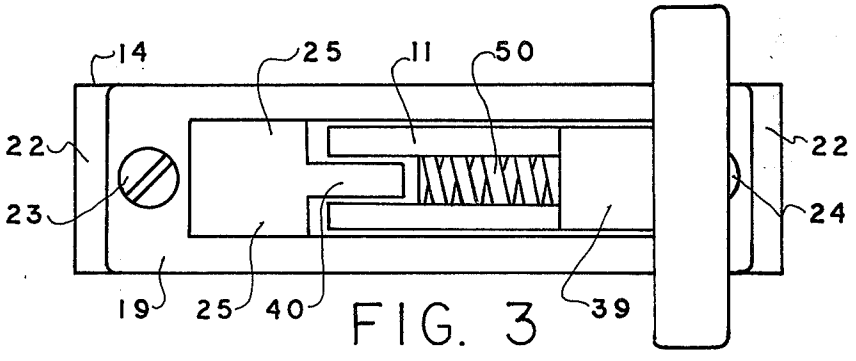


FIG. 3

ANTENNA MOUNT

BACKGROUND OF THE INVENTION

The present invention is generally directed to an antenna mount apparatus and more particularly to an antenna mount for mounting an antenna to a vehicle.

In the past, there have been various devices developed for mounting an antenna, such as a whip antenna, onto a vehicle. In mounting an antenna to a vehicle, it is imperative that such devices include means for safeguarding the mounted antenna from damage while striking a low overhanging obstruction during vehicle movement and also means for lowering the antenna for clearing low overhanging objects.

One prior art device includes a spring at the mount base so that the antenna will merely spring back when striking an object and also allowing the antenna to resiliently bend forward for tieing it down to the vehicle when low overhanging objects are to be cleared. Another approach has been to provide a hinge in an intermediate section of the antenna itself so that it may be tilted forward and secured at its end to the vehicle for clearing overhanging objects. However, the latter approach does not provide for additional resiliency other than that of the antenna itself to protect it from being damaged from striking a low overhanging object during vehicle movement.

Neither of the aforementioned approaches has proven entirely satisfactory. Each requires additional securing means on the vehicle for tieing down the antennas and further require an operator to be outside the vehicle when tieing down the antenna.

It is therefore an object of the present invention to provide an improved antenna mount for mounting an antenna to a vehicle.

It is a further object of the present invention to provide an antenna mount for mounting an antenna to a vehicle which includes means for safeguarding the mounted antenna from damage should it strike a low overhanging object during vehicle movement.

It is a still further object of the present invention to provide an antenna mount for mounting an antenna to a vehicle which includes means for tilting the antenna from the inside of the vehicle passenger compartment for clearing low overhanging objects during vehicle movement.

It is a still further particular object of the present invention to provide an antenna mount for mounting an antenna to a vehicle which disposes the antenna in a vertical semi-locked position and transfers the antenna to an acute position extending towards the rear of the vehicle when the antenna strikes a low overhanging object so that the mounted antenna will be undamaged and lowered for clearing future low overhanging objects.

The invention provides an antenna mount apparatus for mounting an antenna onto a vehicle comprising a base member including a bottom adapted to be secured to a vehicle surface, a cavity having a concave cam surface on a first wall thereof and a convex cam surface on a second wall thereof, the first and second walls being opposite and facing one another, and an elongated slot in the top thereof. The antenna mount additionally comprises a pivotable member within the cavity having a receptacle extending through the elongated slot and adapted for receiving an antenna to be mounted, the pivotable member being pivotable between a first position and a second position. The pivotable member also includes a first convex peripheral surface portion and a shallow concave peripheral surface portion, the first convex peripheral surface portion extending from the receptacle and terminating integrally with the shallow concave portion, the first convex portion and the shallow concave portion facing the concave cam surface when the pivotable member is in the first position, and a second convex peripheral surface portion and a second concave peripheral surface portion, the second convex peripheral surface portion extending from the receptacle to and integrally terminating with the second concave peripheral surface portion, the second concave peripheral surface portion facing and engaged with the base convex cam surface when the pivotable member is in the first position. The antenna mount additionally comprises resilient means for resiliently holding the pivotable member in communication with the base member cavity walls so that when the pivotable member is in the first position, the antenna is disposed in a verticle semilocked position with the second concave peripheral surface portion in engagement with the convex cam surface, and when the pivotable member is in the second position the antenna is disposed in locked acute position with the shallow concave peripheral surface portion engaged with the concave cam surface and the second convex peripheral surface portion engaged with the convex cam surface.

BRIEF DESCRIPTION OF THE DRAWINGS

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The invention, together with further objects and advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings, and in the several figures of which like reference numerals indicate identical elements and in which:

FIG. **1** is a side view of an antenna mount apparatus embodying the present invention in a first operative position;

FIG. **2** is a side view of the antenna mount apparatus of FIG. **1** in a second operative position; and

FIG. **3** is a bottom view of the antenna mount apparatus of FIGS. **1** and **2**.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIGS. **1** and **2**, the antenna mount apparatus there shown includes a base member **10** and a pivotable member **11**. The base member **10** is constructed out of a plurality of laminated sheets of metal, such as aluminum. The outside laminates comprise the side panels of the mount. Side panel **12** is shown in FIGS. **1** and **2** with the opposite side panel removed to render the inner construction of the antenna mount visible. The laminates are held together by screws **28**.

Base member **10** includes an arcuately shaped top section **14**, a bottom **15**, and a cavity **16**.

Top section **14** includes an elongated slot terminating at one end in an abuttment surface **17** and at the other end at a point intermediate the apex of the arcuate top and the bottom **15**. The abuttment surface **17** is located at approximately the apex of the arcuate top section **14**.

The base member bottom **15** includes means for securing the antenna mount to a vehicle which includes

plate 19, threaded screw holes 20 and 21, bottom surface 22, and screws 23 and 24. The antenna base is preferably mounted to the top of the vehicle passenger compartment with the vehicle top disposed inbetween bottom surface 22 and plate 19 to thereby clamp the vehicle top inbetween bottom edge 22 and plate 19 when screws 23 and 24 are threaded into the threaded screw holes 20 and 21 respectively. The base member bottom 15 also includes an elongated opening 25.

Cavity 16 of base member 10 includes a first wall having a concave cam surface 26 and a second wall having a convex cam surface 27. The first and second walls are opposite and facing one another so that the concave cam surface 26 and convex cam surface 27 are opposite and facing one another.

Pivotable member 11 comprises receptacle 30 which extends through the base member elongated slot and which has threads 31 adapted to receive an antenna to be mounted. The pivotable member 11 is pivotable between a first position wherein receptacle 30 is in abuttment relation with the abuttment surface 17 for disposing the mounted antenna in a vertical position and a second position to dispose the mounted antenna in an acute position extending towards the rear of the vehicle. FIG. 2 shows the pivotable member in the second position.

The pivotable member, when in the first position, is in semi-locked relation to the base member 10. To this end, pivotable member 11 includes a first convex peripheral surface portion 32, a shallow concave peripheral surface portion 33, a second convex peripheral surface portion 34, and a second concave peripheral surface portion 35. The first convex peripheral surface portion 32 extends from receptacle 30 and terminates integrally with the shallow concave peripheral portion 33, surface portions 32 and 33 facing towards the front of the vehicle. The second convex peripheral surface portion 34 extends from the receptacle to and integrally terminates with the second concave peripheral surface portion 35, surface portions 34 and 35 facing towards the rear of the vehicle.

When pivotable member 11 is in the first position as shown in FIG. 1, receptacle 30 is in abuttment relation with the abuttment surface 17, convex surface portion 32 and shallow concave surface portion 33 face the concave cam surface 26 with convex surface 32 communicating with the concave cam surface 26, and second concave peripheral surface portion 35 communicates and engages the convex cam surface 27.

Pivotable member 11 also includes an opening 36 and elongated slot 37. The pivotable member is resiliently held in communication with the base member cavity walls by a spring 50 which is disposed between an extension 40 of base member 10 which extends through elongated slot 37 of pivotable member 11 and the inner periphery of opening 36 at spring mount 38.

With spring 50 resiliently holding the pivotable member in communication with the cam surface walls of base member 10 as shown in FIG. 1, pivotable member 11, when in the first position, is semi-locked with the antenna disposed vertically. The second concave peripheral surface 35 and convex cam surface 27 co-act so that should an overhanging obstruction strike the antenna during vehicle movement with sufficient force, the second concave surface 35 and convex cam surface 27 will disengage allowing the pivotable member 11 to pivot and assume the second position as shown in FIG. 2.

As shown in FIG. 2, when the pivotable member is in the second position, the shallow concave surface 33 communicates with the end of the concave cam surface 26 and the second convex peripheral surface 34 communicates with the convex cam surface 27. The end of concave cam surface 26 is engaged with the shallow concave peripheral surface 33 at a point intermediate the ends of the shallow concave surface so that pivotable member 11 cannot be pivoted unless it is displaced downward relative to base member 10. When pivotable member is in the second position, the antenna is disposed in a locked acute almost horizontal position extending rearwardly of the vehicle to thereby clear further low overhanging obstructions. Pivotable member 11 has a handle extension 39 which extends through the elongated opening 25 of the base member bottom 15 into the passenger compartment of the vehicle. In order to restore the antenna mount into the first position, handle 39 is pulled down and displaced arcuately to cause pivotable member 11 to pivot back to the first position as shown in FIG. 1. By pulling down on handle 39, the shallow concave surface 33 is disengaged and cleared from the end of the concave cam surface 26 to allow pivotable member 11 to be pivoted back to the first position when handle 39 is shifted arcuately to the right.

FIG. 3 shows the antenna mount as it appears from the bottom thereof. As can be clearly seen in FIG. 3, extension 40 of base member 10 extends through the elongated slot 37 of pivotable member 11. Also clearly seen in FIG. 3 is the elongated opening 25 of base member 10 and handle 39 extending through the elongated opening.

The present invention provides an antenna mount apparatus which allows an antenna to be mounted onto a vehicle and which prevents the antenna from being damaged should it strike a low overhanging obstruction during vehicle movement. The antenna mount is arranged to dispose the antenna in an acute position should it strike an obstruction with sufficient force to cause the pivotable member to pivot to the second position. The amount of force required to cause the pivotable member to pivot may be varied by selecting springs having different spring constants. Also, the antenna may be connected to a suitable transmitter merely by insulating the antenna mount from the vehicle and securing the center conductor of conventional coax to one of the mounting screws and the ground braid to the vehicle top.

While a particular embodiment of the invention has been shown and described, modifications may be made, and it is intended in the appended claims to cover all such modifications as may fall within the true spirit and scope of the invention.

I claim:

1. An antenna mount apparatus for mounting an antenna onto a vehicle comprising:

a base member including a bottom adapted to be secured to a vehicle surface, a cavity having a concave cam surface on a first wall thereof and a convex cam surface on a second wall thereof, said first and second walls being opposite and facing one another, and an elongated slot in the top of said base member and separating said cam surfaces;

a pivotable member within said cavity having a receptacle extending through said elongated slot and adapted for receiving an antenna to be mounted, said pivotable member being pivotable between a

first position and a second position, said pivotable member also including a first convex peripheral surface portion and a shallow concave peripheral surface portion, said first convex peripheral surface portion extending from said receptacle and terminating integrally with said shallow concave portion, said first convex portion and said shallow concave portion facing said concave cam surface when said pivotable member is in said first position, and a second convex peripheral surface portion and a second concave peripheral surface portion, said second convex peripheral surface portion extending from said receptacle to and integrally terminating with said second concave peripheral surface portion, said second concave peripheral surface portion facing and engaged with said base convex cam surface when said pivotable member is in said first position; and

resilient means for resiliently holding said pivotable member in communication with said base member cavity walls; whereby,

when said pivotable member is in said first position, the antenna is disposed in a vertical semi-locked position with said second concave peripheral surface portion in engagement with said convex cam surface, and when said pivotable member is in said second position the antenna is disposed in locked acute position with said shallow concave peripheral surface portion engaged with said concave cam surface and said second convex peripheral surface portion engaged with said convex cam surface.

2. An apparatus in accordance with claim **1** wherein said elongated base member slot includes an abuttment surface at one end, and wherein said receptacle is in abuttment relation with said abuttment surface when said pivotable member is in said first position.

3. An apparatus in accordance with claim **2** wherein the top of said base member is substantially arcuately shaped and wherein said abuttment surface is approximately at the apex of said arc.

4. An apparatus in accordance with claim **3** wherein said base member bottom includes an elongated opening and wherein said pivotable member includes an extension extending through said base member opening forming a handle, the arcuate displacement of which causes said pivotable member to be pivoted between said first and second positions.

5. An apparatus in accordance with claim **4** wherein said pivotable member is also vertically displaceable within said cavity for unlocking the engagement of said shallow concave peripheral portion and said concave cam surface with downward displacement of said pivotable member.

6. An apparatus in accordance with claim **5** wherein said resilient means comprises a spring.

7. An apparatus in accordance with claim **6** wherein said pivotable member includes an opening and an elongated slot, and wherein said base member includes an extension extending through said pivotable member slot, and wherein said spring is disposed between said base member extension and the inner peripheral surface of said pivotable member opening.

8. An apparatus in accordance with claim **7** wherein said pivotable member elongated slot is in said shallow concave peripheral portion.

9. An antenna mount apparatus for mounting an antenna onto a vehicle comprising:

a base member including a bottom adapted to be secured to a vehicle surface, a cavity within said base member having a concave cam surface on a first wall thereof and a convex cam surface on a second wall thereof, said first and second walls being opposite and facing one another, an elongated slot in the top thereof terminating at one end in an abuttment surface, and an elongated opening in said bottom;

a pivotable member within said cavity having a receptacle extending through said elongated slot and adapted for receiving an antenna to be mounted, said pivotable member being pivotable between a first position wherein said receptacle is in abuttment relation with said abuttment surface and a second position, said pivotable member also including a first convex peripheral surface portion and a shallow concave peripheral surface portion, said first convex peripheral surface portion extending from said receptacle and terminating integrally with said shallow concave portion, said first convex portion and said shallow concave portion facing said concave cam surface when said pivotable member is in said first position, and a second convex peripheral surface portion and a second concave peripheral surface portion, said second convex peripheral surface portion extending from said receptacle to and integrally terminating with said second concave peripheral surface portion, said second concave peripheral surface portion facing and engaged with said base convex cam surface when said pivotable member is in said first position, and a handle extension extending through said base member elongated opening, the arcuate displacement of which causes said pivotable member to be pivoted between said first and second positions; and

a spring for resiliently holding said pivotable member in communication with said base member cavity walls; whereby,

when said pivotable member is in said first position, said receptacle is in abuttment relation with said abuttment surface and said antenna is disposed in a vertical semilocked position with said second concave peripheral surface portion in engagement with said convex cam surface so that when the antenna strikes an obstruction the pivotable member will assume said second position to dispose the antenna in locked acute position for clearing further obstructions with said shallow concave peripheral surface portion engaged with said concave cam surface and said second convex peripheral surface portion engaged with said convex cam surface.

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