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FLEXIBLE BASE ASSEMBLY

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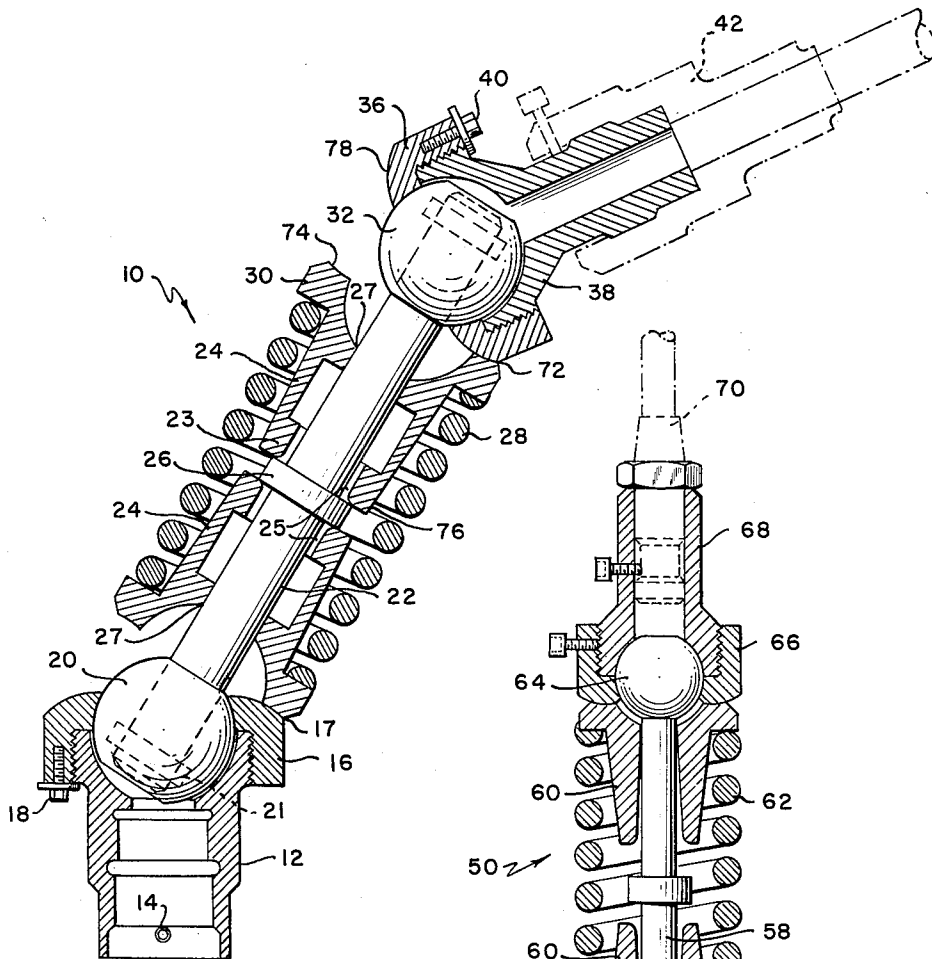


FIG. 1.

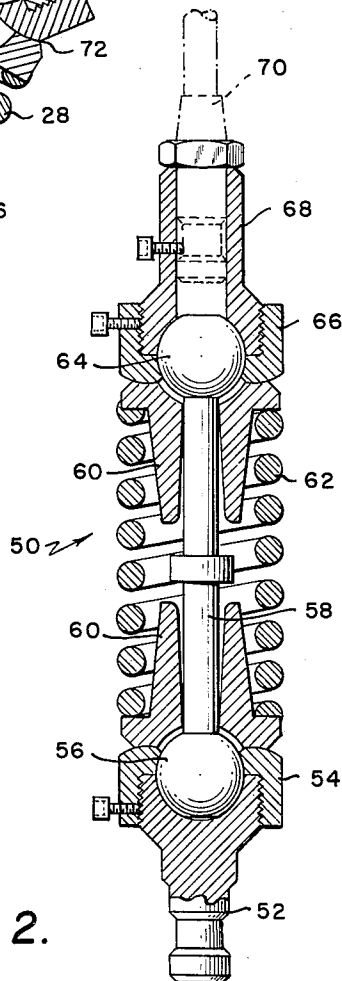


FIG. 2.

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1

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FLEXIBLE BASE ASSEMBLY

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3 Claims. (Cl. 174-86)

This invention relates to a flexible base assembly and more particularly to a flexible base assembly for enabling a whip antenna to pivot in a drag stream.

As submarines and other modern vessels achieve higher and higher speeds, the stress on the whip antenna becomes quite high. The stress is particularly high where there is no provision to allow the antenna to pivot from the vertical position. An antenna fixed at a position other than vertical is less desirable for communicating. Larger antennas to withstand the stress are impractical.

The general purpose of this invention is to provide a flexible base assembly which maintains the stress on the whip antenna within tolerable limits. To attain this the whip antenna is pivoted into the drag stream by a flexible base assembly.

An object of the present invention is to provide an assembly to substantially reduce the failure of whip antennas.

Another object of this invention is to provide for the use of slender ship antennas of practical size without ensuing antenna failures.

Yet another object of this invention is to provide for the use of vertical antenna capable of having a silhouette that can be streamlined with the drag stream.

With these and other objects in view, as will hereinafter more fully appear and which will be more particularly pointed out in the appended claims, reference is now made to the following description taken in connection with the accompanying drawings in which:

FIG. 1 shows a flexible base assembly in a deflected position.

FIG. 2 shows a smaller base assembly in a normal vertical position.

Referring now to the drawings, wherein like reference numerals designate like or corresponding parts throughout the two figures, there is shown in FIG. 1 a deflected flexible base assembly designated generally as reference numeral 10. A large end cap 12 is used to fasten the base assembly to a submarine or other vessel or mounting surface. Preferably the end cap 12 fits over a stud or other protruding elements and is held in contact therewith by a safety cap screw 14.

The end cap 12 is fastened to a socket cap 16. A safety screw 18 keeps the end cap 12 and socket cap 16 from becoming unfastened. The outer portion of the socket joint 16 is curved to act as a cam surface 17.

Confined within a socket formed by the end cap 12 and the socket cap 16 is a ball pivot 20. Secured to the ball pivot 20 is a guide bar 22. The securing means for the guide bar and ball pivot may be any conventional securing means. For example, a dowel pin 21 is shown in the drawing as the securing means.

Surrounding the guide bar 22 are two sliding sleeves 24, the end of which are shaped to ride on the cam surface 17 and curved surface 78 to be referred to later. The two sleeves face each other at an abutment 26. The abutment 26 acts as a stop for the sleeves 24 and therefore controls the maximum amount of deflection of each end of the base assembly. The spacing between the sleeves 24 and the guide bar 22 is sufficient at the abutment end 23 to allow the sleeves to rock. Thus in a deflected position of the base assembly, the sleeves 24 rock and the sleeve surfaces 25 are in contact with the guide bar 22. The spacing 27 between the guide bar 22 and sleeve 24 is quite small but

2

still sufficient to allow the sleeves 24 to rock. A compression spring 28 surrounds the guide bar and is confined between flanges 30 on the extreme end respectively of the sleeves 24.

The other end of the guide bar 22 is secured to a ball pivot 32 which is similar to the other ball pivot 20.

A socket cap 36 combines with a whip end connector 38 to confine the ball pivot 32 with the cavity defined by the juncture of the two. A safety screw 40 is similar to and performs the same function as safety screw 18.

Shown in FIG. 1 in dotted lines is a whip antenna base 42 fastened to the whip end connector 38.

A smaller flexible base assembly 50 is shown in FIG. 2. A mast end connector 52 is secured to the submarine. A socket cap 54 combines with the connector 52 to enclose a ball pivot 56. A guide bar 58 is fastened to the ball pivot 56. Surrounding the guide bar 58 are sliding sleeves 60 and a compression spring 62 in the same manner as in FIG. 1. The interior surface 61 of the sleeves 60 is shaped to allow the sleeves to rock when the assembly is deflected.

A ball pivot 64, secured to the guide bar 58 is enclosed within a socket joint 66 and a whip end connector 68. A whip antenna 70 shown in dotted lines, is secured to the connector 68.

Operation

The base assemblies shown in FIG. 1 and FIG. 2 function in the same manner. The flexible base assembly 50, FIG. 2, holds a whip antenna in a normally vertical position. Upon being subjected to a drag stream of sufficient force, which places a stress upon the antenna, the base assembly 10, FIG. 1, bends thus streamlining the antenna with the drag stream and reducing the drag force and consequently the stress on the antenna. The socket cap 36 pivots on ball pivot 32 thus compressing the spring 28 contained within the flanges 30 of the sliding sleeves 24.

The ball pivot 20 pivots within the socket cap 16 with a further compression of the spring 28 contained within the flanges 30 of the sliding sleeves 24.

In a deflected position the force pushes the fulcrum point 72 of the sliding sleeve 24 with the result that the curve free side 74 moves up and the inner edge 76 is forced against the guide bar 22.

When the drag stream force is removed then the curved surface 78 of the socket cap 36 engages the free side 74 while the spring 28 is still under compression. The force on the free side 74 against the surface 78 eases the socket joint back into normal position while dampening out any vibration. In this manner there is no rocking back and forth of the antenna since the spring 28 is under compression and creates a force against the fulcrum 72 and surface 78 when the base assembly is in a normal position.

The base assembly is capable of deflecting in any of 360 degrees about the base plane and therefore will function to compensate for a drag stream coming from any direction.

The illustrated model shown in the drawing is designed to deflect a maximum of 35 degrees on each ball pivot for a total of 70 degrees. However, a base assembly could be designed to pivot less than 70 degrees or as much as 90 degrees.

Under certain conditions there may only be a need for one section to pivot thus eliminating or locking the action of one ball pivot.

The base assembly may be fitted with an alemite fitting to supply lubrication to the ball pivots 20 and 32.

The apparatus shown and described is merely illustrative and the invention is not limited thereto. Alterations and modification will readily suggest themselves to persons skilled in the art without departing from the true spirit of this invention or from the scope of the annexed claims.

What is claimed is:

1. An antenna mount for submarines comprising:
 a guide bar having a ball member on each end thereof
 and an abutment mounted therebetween;
 each of said ball members secured in a socket member
 comprising a first cap member provided with a socket
 portion for receiving said ball member and a second
 cap member for retaining said ball member in said
 first cap member;
 first and second sliding sleeve means slidably surround-
 ing said guide bar, each of said sliding sleeve means
 being mounted on either side of said abutment, each
 of said sleeves having a shoulder forming an abut-
 ment at one of its ends;
 a spring member concentrically mounted around said
 first and second sleeve members between said shoul-
 ders on said sleeves for biasing said sleeves against
 said second cap members;
 said second cap members and said shoulders having
 mating curved surfaces in engagement with each
 other so as to provide for tilting movement of said
 socket members with respect to said guide bar; and
 said abutment on said guide bar having a radial extent
 which exceeds the inner diameter of the other ends
 of said sliding sleeve members thereby restraining the
 degree of tilt of the socket members relative to the
 guide bar.

2. An antenna mount for submarines are defined in
 claim 1 but further characterized by having an antenna
 mounting means connected to the other end of one of said
 socket members for attaching an antenna to said mount
 whereby an antenna is held in a vertical position for
 transmitting and receiving yet is capable of being stream-
 lined when subjected to a drag force.

3. An antenna mount for submarines as defined in claim
 2 but further characterized by having an antenna con-
 nected to said antenna mounting means, said antenna being
 capable of pivoting in any direction.

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