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ILLUMINATED ANTENNA ASSEMBLY

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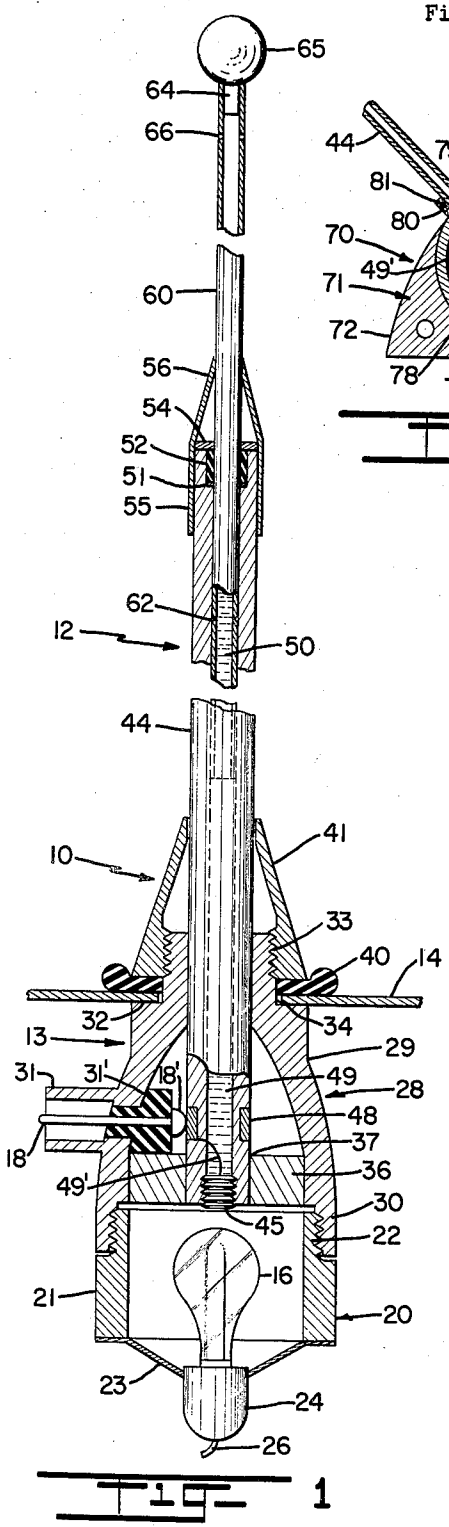


FIG. 1

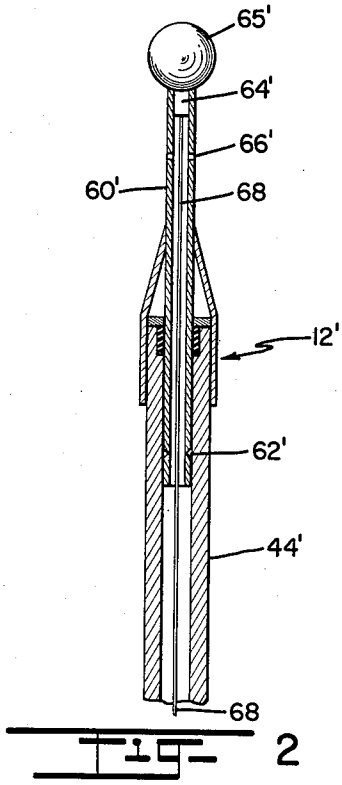


FIG. 2

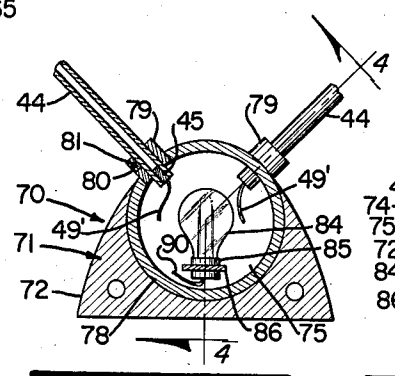


FIG. 3

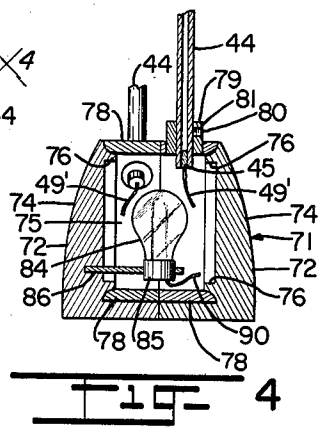


FIG. 4

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ILLUMINATED ANTENNA ASSEMBLY

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This invention relates to a new and useful antenna assembly and more particularly relates to a light conductive, combined signal and antenna construction adaptable for use in various applications, such as, motor vehicles, radio and television sets, and in which application the assembly of the present invention lends a decorative effect, in addition to its utility.

In the construction of combined signal and antenna assemblies, it is desirable to make such assemblies extensible or telescoping so as to be adjustable in height; yet, to retain simplicity of construction together with the necessary light and electrical conductivity. Previously, some difficulty has been encountered in making antennas of the telescoping type with the desired light and electrical conductivity without becoming unduly complicated, particularly in the manner of retaining complete electrical conduction regardless of the relative disposition of the telescoping members. This is so because the telescoping sections must necessarily be made of some clear light conductive material which is not electrically conductive so as to require separate, extensible electrical conducting means through the sections for transmission of the audio or vidio signals.

Accordingly, it is a principal object of the present invention to provide for a telescoping antenna of the character described which is capable of conducting both light and electricity in a greatly simplified manner and employing a minimum number of parts.

It is another object of the present invention to make provision for an antenna assembly which has greatly improved insulating characteristics for receiving audio and video signals while being light conductive throughout and moreover can be tinted with various colors to provide an illuminated decorative effect.

It is a further object to make provision for a telescoping antenna structure serving as a combined warning signal and decorative structure which is easy and economical to manufacture, simplified in construction and arrangement and which is reliable and dependable in operation.

Further objects, advantages and features of the present invention and not specifically set forth hereinabove will become more apparent from a consideration of the following detailed description together with the accompanying drawing of preferred and alternative embodiments of the present invention and wherein:

FIGURE 1 is a view, partially in section, illustrating a preferred embodiment of the present invention in mounted relation to a motor vehicle;

FIGURE 2 is a fragmentary view, partially in section, illustrating an alternate form of antenna assembly, in accordance with the present invention;

FIGURE 3 is a front view of a television antenna assembly incorporating the preferred form of antenna structure shown in FIGURE 1; and

FIGURE 4 is a side view of the television antenna assembly illustrated in FIGURE 3.

Referring in detail to the drawing, in FIGURE 1 there is shown a preferred form of the present invention wherein antenna assembly 10 is broadly comprised of a telescoping antenna 12 and base structure 13 mounted in suitable paneling 14 representing, for example, the body paneling of a motor vehicle for connection into the car radio.

The base 13 broadly serves as a housing for a light

source indicated at 16, also as a means of interconnection between the antenna 12 and an antenna lead 18 to the car radio, as well as to position the antenna 12 in desired relation to the motor vehicle. Accordingly, and to this end, the base is comprised of a reflector portion 20 in the form of a sleeve 21 having a threaded male end 22, a cone-shaped reflective member 23, a light socket 24 at the base of the cone and a connecting wire 26 which may be connected into one of the car wiring circuits. An antenna mounting portion 28 is in the form of a hollow cap 29 having a female end portion 30 threaded to the male end 22, a lead-in socket 31 including a fitting 31' to accommodate the antenna lead 18, a shoulder 32 abutting the inside surface of the car panel, and a reduced threaded portion 33 projecting upwardly through opening 34 in the panel. A spacer or washer 36, preferably composed of fibrous material, is positioned at the lower end of the cap having a central opening 37 to accommodate the lower end of the antenna 12. To hold the entire base portion in clamped relation to the panel, a gasket 40 and lock nut 41 are positioned over the reduced portion 33 of the cap and with the antenna extending vertically through both the lock nut and reduced portion into snug-fitting relation with the washer 36.

As a highly important feature of the present invention, the antenna 12 is made telescoping as in conventional antennas but serves both as a means of conduction of light and audio signals therethrough. To accomplish this, the antenna is comprised of a lower stationary tubular section 44 which actually extends downwardly through the cap portion 28 of the base and is mounted in stationary, snug-fitting relation within the washer 36 with a lower threaded plug member 45 closing the lower end of the section 44. In order to establish electrical contact between the connection wire 18 and the antenna, a contact ring 48 of metallic material is embedded adjacent the lower end of the section 44 and a connecting wire 49 extends from the upper extremity of the cap through the body of the lower tubular section into contact with the ring 48, the latter in turn being disposed in abutting relation with enlarged head 18' of the connecting wire 18. The entire body of the tubular section is composed of a translucent or transparent material, such as Plexiglas or various other plastic substances which have light conducting or transmitting characteristics. Within the body, a central opening 49 is filled with a liquid metal substance 50, such as mercury, to a point adjacent the upper extremity of the section. A resilient lock washer 51 and rubber or rubber-like gasket 52 are positioned within a groove formed at the upper extremity of the lower section, the washer and gasket combination being held in place by means of an annular plate 54. In turn, the plate forms an inward extension between an outer sleeve 55, positioned in snug-fitting surrounding relation to the upper extremity, and a conical extension 56 tapering upwardly therefrom.

An upper tubular section 60 is arranged in slidable telescoping relation to the lower section, the upper section having an outer diameter closely corresponding with the diameter of the opening 49 of the lower section and with a lock groove 62 adjacent its lower end which upon moving into alignment with the lock washer 51 will permit the washer to expand into the groove to hold the telescoping section against accidental removal. Preferably, the body of the upper tubular section 60 is composed of metal and, to seal the upper end of the section, a plastic stem 64 including an enlarged ball portion 65 is inserted therein. An air opening 66 of limited size is located adjacent the upper end, and as designated in the drawing, inward movement of the section 60 through the lower section will cause the mercury to become displaced upwardly through the upper tubular section 60 while the sealed rela-

tion established between the gaskets 54 and section 60 will prevent the mercury from flowing outwardly between the sections.

In the alternate form of FIGURE 2, antenna 12' is modified so as to comprise upper and lower tubular sections, both composed of a material which will be capable of transmitting light from the light source throughout the length of the antenna assembly. In this form, a lower tubular section 44' is constructed identically to the lower section 44 of FIGURE 1 and where like parts are similarly identified. The upper section is, however, formed somewhat differently in order to provide for complete illumination throughout its length and for this purpose section 60' is again generally tubular and is composed of a translucent or transparent sturdy material identical to that preferably employed in the lower section. Also, the upper section is similarly dimensioned for slidable, close-fitting movement through the lower section and in telescoping relation therewith. A lock groove 62' is again provided at the lower end of the upper section, a stem 64' and enlarged head portion are inserted in the top of the section 60', and a bleed opening 66' is located adjacent the top to permit release of air as the upper section is forced down through the liquid metal in the lower section. As a unique feature of this form, a wire element 68 is suspended from the stem and extends through the hollow center of the section and into the lower section for immersion in the mercury or other liquid metal substance. Here, the wire is of a length to remain in contact with the mercury irrespective of the extent of outward movement of the upper section relative to the lower section.

In the preferred and alternate forms, mercury has been found to act as a particularly good conductor for audio signals with a notable absence of interference, and of course the body of the antenna cooperates in this respect. However, in either mode, the mercury permits desired extension and retraction of the telescoping section without in any way affecting electrical conduction, and surprisingly does not in any way deter from the effective transmission of light through the telescoping sections. In this relation, the opening in the upper telescoping section should be of a size and length to permit complete displacement of the mercury into the upper section so that the upper section can be completely retracted into the lower section. Alternately, the lower section may be enlarged somewhat to provide excess space for displacement of the mercury, and the upper section being in the form of a metal rod, limited in outward travel so as to always maintain the necessary contact with the mercury. Broadly, therefore, the lower section contains electrical conducting means physically separate from the conducting means in the upper section, but which are in constant electrical contacting relation with one another while permitting free inward and outward travel of the upper sections.

In FIGURES 3 and 4, a television antenna assembly 70 is illustrated and where either form of antenna structure as shown in FIGURES 1 and 2 may be employed in association therewith, although for the purpose of illustration, it will be described in connection with the use of the preferred form of antenna 12 shown in FIGURE 1. Broadly, the assembly 70 is made up of a base 71 defined by connected halves 72 having upright sides 74 forming an open central area 75. Each side includes an inwardly directed, circular rim 76 carrying a pair of ring or wheel members 78. The latter are mounted in juxtaposed relation so as to be free to rotate in relation to one another and to the circular rims. Each ring in turn has a radial, outwardly projecting sleeve 79 to accommodate a lower section 44 of the antenna assembly, it being understood that the construction of the antenna is not shown, as it is identical to that illustrated in FIGURE 1. Suitable means can be used to position the lower section in place, such as an Allen screw 80 extending through a threaded opening 81 in the side of each sleeve so as to bear against the surface of the lower section. A plug 45 with lead wire 49' is positioned in the bottom of each lower section through the center opening and sides of the base for connection to the television set.

In order to illuminate both antennas, notwithstanding their relative angular disposition, a light source 84 is mounted in a socket 85 positioned on a stationary, horizontal bracket 86 projecting from one side of the base through the center area 75. A reflective coating may or may not be applied to the inner surface of the rings as desired, since the light is entirely capable itself of illuminating the antennas directly and for example here a conventional 15 or 20 watt bulb may be employed for this purpose. A lead 90 extends from the light socket through an opening, not shown, in the bottom of the base for connection into an electrical outlet; or, if desired, the light source may be battery powered.

The double antenna structure may be dimensioned to be of any desired length and where the antennas are made to be freely rotatable on the rings through 180° to any relative angular relation. In all forms, the plastic body section can be tinted various different colors so as to give off a diffused light glow of the desired color throughout the plastic portion of the antenna. When employed as a television antenna, for example, of course this effect is entirely decorative whereas when employed on vehicles such as automobiles or boats, it can serve also as a combined warning signal.

The television base, as well as parts forming the motor vehicle base, may be composed of any number of materials preferably having the characteristics of being rugged and yet which will completely insulate the electrically conductive portion of the antenna assembly. Thus, "Bakelite" or a number of the hard plastics would be entirely satisfactory. In addition, the composition of the body of the upper and lower tubular sections as in FIGURE 2 or just the lower section of FIGURE 1 may be composed of any desired translucent or transparent plastic material such as Plexiglas, fiberglass, or vinyl plastics, as typical examples. Moreover, the body portions may be tinted to provide various different coloring effects either for the purpose of decoration or to serve as a warning signal device.

Accordingly, it is to be understood that various modifications, substitutions and changes in parts and compositions of material may be resorted to without departing from the scope of the present invention as defined by the appended claims.

What is claimed is:

1. An illuminated antenna assembly having a base, said base including a light source therein, and at least one antenna comprising a lower tubular section composed of a transparent material mounted on said base in light transmitting relation to said light source and including a liquid metal substance filling the opening in said tubular section, an upper elongate section arranged in sealed, slidable telescoping relation to said lower tubular section, and electrical conducting means extending the length of said upper section being in constant electrical conducting relation with the liquid metal substance notwithstanding inward and outward travel of said upper section in relation to said lower section.

2. A light reflective antenna assembly according to claim 1, said upper section having a body composed of a metallic material.

3. A light reflective antenna assembly according to claim 1, said upper section having a body in the form of a transparent tubular member, and said electrical conducting means being in the form of a wire element extending throughout the length of said upper section and projecting into the liquid metal substance in said lower section.

4. An illuminated antenna assembly according to claim 1, said base being mounted in the paneling of a motor vehicle, and said telescoping sections extending upwardly from said base and the motor vehicle.

5. An illuminated antenna assembly for motor vehicles having a base, said base including a light source

and an upwardly facing light reflective member contained therein, and an antenna comprising a lower tubular section mounted in stationary relation in said base opposite said light reflective member, said lower section being composed of a transparent non-metal material conductive of light rays from the light source and light reflective member, a liquid metal substance filling the opening in said lower section, an upper metallic tubular section arranged in sealed, slidable telescoping relation to said lower tubular section, said upper section being movable in relation to said lower section while remaining in electrical conducting relation with said liquid metal.

6. A television antenna assembly having a base carrying a pair of juxtaposed rotatable ring members thereon and including a light source positioned within said ring members, and an antenna for each ring, each antenna comprising a lower tubular section projecting through a ring in light transmitting relation to said light source, a liquid metal substance filling the opening in said lower tubular section, an upper metallic tubular section arranged in sealed, slidable telescoping relation to said lower tubular section, said lower section being composed of a transparent material to conduct light rays from the light source through said lower section, and said upper section being movable through said lower section thereby displacing said liquid metal into said upper section while remaining in electrical conducting relation therewith.

7. An illuminated antenna assembly having a base, said base including a light source therein, and at least one antenna comprising a lower tubular section composed of a transparent material mounted on said base in light transmitting relation to said light source, an upper elongate section arranged in sealed, slidable telescoping relation to said lower tubular section, and separate electrical conducting means within each of said upper and lower tubular sections being in constant electrical conducting relation with one another while providing for free inward and outward travel of said upper section in relation to said lower section.

No references cited.