

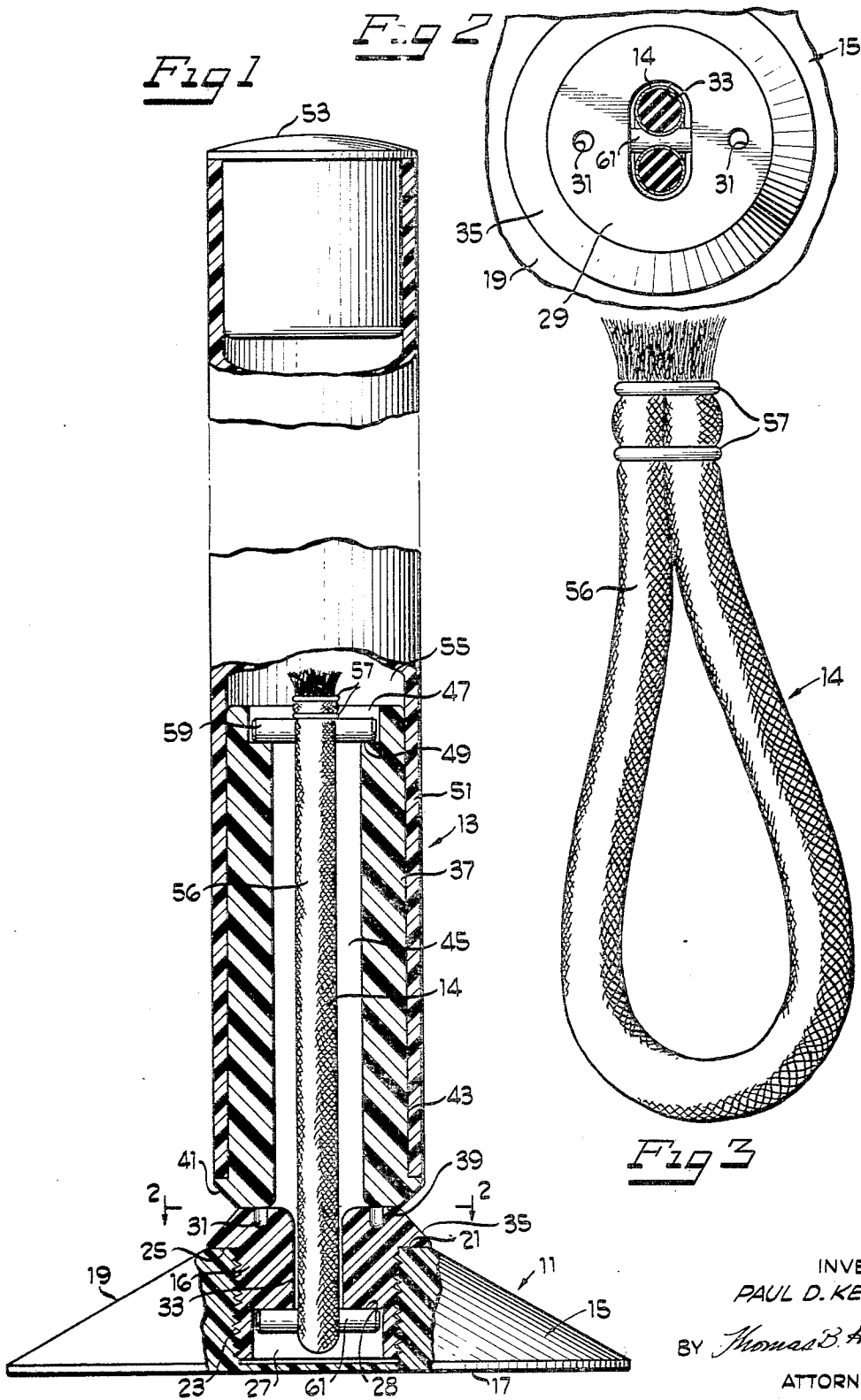
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SIGNAL DEVICE

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SIGNAL DEVICE
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4 Claims

DETAILED DESCRIPTION

ABSTRACT OF THE DISCLOSURE

A resiliently supported roadway signal device including a base to be secured to the roadway, a rigid elongated standard adapted to provide a warning signal and a tensioned elastic member connected between the base and the standard to yieldably retain the standard upon the base. The tensioned elastic member is formed to define a continuous loop including two tensioned lengths extending between the base and standard and integral end portions securely connected to the base of the standard.

BACKGROUND OF THE INVENTION

This invention relates to a signal device for roadway marking. More particularly, it relates to a signal device which is resiliently supported to yield upon impact and thereafter return to its initial position.

Signal devices utilized for roadway marking have been devised which utilize a tensioned elastic element to yieldably retain an elongated warning standard upon a base. Such an arrangement allows deflection of the standard upon impact by a passing vehicle and provides a restoring force to reposition the standard after removal of the deflecting force. These arrangements include a single strand or length of elastic material connected between the base and standard.

The major objective of the present invention is to provide an improved signal device utilizing a tensioned elastic member to retain the standard upon the base which may be assembled with ease and which insures continued effective operation after prolonged exposure to vehicular contact.

It is another important object of the present invention to provide an improved form of signal device which includes an elastic member formed to define a continuous loop presenting a pair of tensioned lengths yieldably retaining the standard upon the base.

SUMMARY OF THE INVENTION

Very generally, the signal device of the present invention includes an elongated, generally vertical standard supported upon a base adapted for connection to a roadway. The standard is yieldably retained upon the base by a tensioned elastic member formed to define a continuous tensioned loop connected between the standard and the base. The looped member simplifies assembly of the device and insures effective functioning without dislodgement of the elastic member or loss of tension even after prolonged incidence of impact.

DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a fragmentary sectional elevational view of a signalling device illustrating various features of the present invention;

FIGURE 2 is a fragmentary sectional view of the device shown in FIGURE 1 taken generally along the line 2—2 of that figure; and

FIGURE 3 is a perspective view on a slightly enlarged scale of a portion of the device of FIGURE 1.

Turning now to the drawings there is shown an embodiment of a signal device which is illustrative of the principles of the present invention.

The signal device includes a base 11, a generally vertical standard 13 and a connector 14.

The base includes a disc 15 and a removal plug 16. The disc includes a generally flat bottom wall 17 suitable for attachment to a road surface. Attachment may be accomplished with any suitable adhesive or fastener.

The disc 15 further includes a generally conical or tapered upper surface 19 which presents a minimal obstruction to the passage of the wheel of a vehicle. The conical surface terminates at a planar surface 21 which includes a threaded aperture 23 extending inwardly of the disc.

The plug 16 is generally annular and includes a threaded portion secured to the threaded aperture 23 of the disc. It further includes a stop surface 25 disposed in contact with the planar surface 21 of the disc 15.

An end of the plug disposed internally of the threaded aperture 23 includes a counter bore 27 defining a reaction surface 28. An opposite end of the plug includes a planar support surface 29 which supports the standard 13 in its operative position. The planar support surface 29 includes a pair of detents or apertures 31 extending inwardly of the plug. These detents are disposed upon a diameter concentric with the vertical centerline of the device and are spaced approximately 180° apart. As best seen in FIGURE 2, the plug 16 includes an aperture 33 having an elongated cross-section extending from the surface 29 to the counter bore 27 disposed generally centrally of the plug.

A truncated conical surface 35 extends between the stop surface 25 and the support surface 29.

The elongated standard 13 is relatively long to insure presentation of a clearly visible warning signal to passing motorists. In the embodiment illustrated, the standard is of a generally cylindrical shape, however, any suitable cross section may be used such as square, triangular or hexagonal.

The elongated standard 13 includes an elongated annular ring 37 disposed in overlying relation to the plug 16.

The ring 37 includes a contact surface 39 which is supported upon the surface 29 of the plug and which is approximately the same diameter as the surface 29.

An inverted conical surface 41 extends from the contact surface 39 and terminates at the outer periphery of the standard. The slope of this surface is approximately equal to the slope of the conical surface 35 of the plug 16.

The ring 37 is provided with an elongated annular relief 43 extending from the conical surface 41 along the entire peripheral extent of the ring.

The ring 37 further includes a central bore 45 having a diameter approximately equal to the maximum width of the elongated aperture 33 of the plug 16.

An end of the ring opposite the end including the contact surface 39 is provided with a counter bore 47 open to the central bore 45. The counter bore has a diameter larger than the diameter of the central bore to define a reaction surface 49.

The outer peripheral surface of the standard is defined by a tubular member 51 secured to the ring 37 at the elongated annular relief 43 which is appropriately sized to receive an end of the tube. The outer peripheral surface of the tubular member may be coated with reflective material to improve effectiveness as a warning signal in darkness and in addition may include an appropriate legend or painted pattern to attract attention.

A cap 53 is secured to the tubular member at an end opposite the end connected to the ring 37. The cap 53, tubular member 51 and the ring 37 therefore define a cavity 55 sealed from exposure to adverse elemental conditions.

The cap may be of any suitable shape and if desired may be fastened by threads for easy removal. It may, if desired, include an appropriate receptacle for attachment of a flag, lights or other signal device.

The connector 14 is connected to both the standard 13 and the base 11 and yieldably retains the standard in position with the contact surface 39 supported upon the surface 29 of the plug 16.

The connector is made of resilient elastic material which may be elongated or stretched upon application of force and which will thereafter contract to its initial free length. A suitable material for this application is elastic "shock cord" which includes an inner core of elastic material covered with a sheath of knitted or woven fabric made of cotton, nylon, Dacron or other material which is designed to accommodate elongation and contraction of the resilient portion.

A particular example of an elastic shock cord found suitable is 1/2 inch diameter shock cord, double cotton covered, single strand to show 100% elongation at 175 to 250 pounds force, MIL specification number MIL-C5651B.

The elastic member 14, as best seen in FIGURE 3, is formed to define a continuous loop 56. A single length of elastic material is used which is doubled over and the free ends fastened together by compressed metal rings 57. Any suitable fastener may be used to form the loop and any other looped arrangement may be utilized such as a molded continuous loop or the like.

The loop 56 extends through the central bore 47 of the ring 37 and through the elongated aperture 33 of the plug 16 between the counter bores 27 and 45.

The loop 56 is connected to the standard 13 by a retainer pin 59 which extends through the loop and contacts the interior surface of the loop and the reaction surface 49. The loop is connected to the plug 16 by a similar retainer pin 61 which extends through the loop and contacts the interior surface of the loop and the reaction surface 28.

The loop 56 is sized such that when positioned as described, the elastic member is elongated and therefore placed in tension. That is to say, the circumference of the internal surface of the loop when in its free or relaxed state is less than twice the distance between the points of contact of the internal surface of the loop with the portions of the retainer pins 59 and 61 spaced furthest from the reaction surfaces 28 and 49.

When positioned about the retainer pins 59 and 61 the loop 56 presents two tensioned lengths extending between the standard 13 and base 11. These tensioned lengths produce a force which retains the standard in place upon the base. Deflection of the standard by the striking vehicle causes further elongation of the tensioned lengths which increases the tension and establishes a restoring force which returns the standard to its initial position upon removal of the deflecting force.

The looped construction and retainer pins provide an effective elastic connector which cannot be dislodged upon impact. Also it has been found that the loop 56, as formed of a single length of elastic material fastened together by the compressed metal rings 57, is not susceptible to loss of tension due to breakdown of the connecting arrangement or increase of the loop size by virtue of ring slippage.

During deflection, the conical surfaces 35 and 41 are urged into contact along a line opposite the line of action of the deflection force. Upon return, the contact between these surfaces represents a fulcrum line which facilitates restoration of the standard to its initial position. These surfaces, while being illustrated as conical could assume any suitable shape such as spherical or the like. In addition,

the diameter of the planar surface 29 and contact surface 39 may be varied to vary the resistance of the standard to deflection and ability to oscillate after the deflecting force is removed. That is to say, if the diameter is decreased resistance to deflection decreases and the ability to oscillate after the impact force is removed is increased.

The signal device described may be made of any suitable material. It is contemplated that plastic such as ABS plastic is a particularly suitable material because of its excellent durability, strength and ability to withstand impact and exposure to the elements. Also, if plastic is used, the separate elements of the standard may be secured together by solvent welding. An example of plastic which may be used is "Cyclolac" (registered trademark) plastic.

Assembly of the signal device is extremely simple. The plug 16 and ring 37 are first connected utilizing the loop 56. The loop 56 is positioned within the central bore 45 of the ring and the elongated aperture 33 of the plug. The loop is positioned to enable insertion of one of the retainer pins 59 or 61 and thereafter elongated or stretched to enable insertion of the other pin. Upon release of the loop it contracts about the pins and assumes its tensioned condition between the plug 16 and ring 37. This sub-assembly forms, in effect, a tensioned hinge which could be utilized in applications other than the signal device illustrated.

For example, an elongated cylindrical member similar to the standard 13 may be substituted for the base 11 with the connector 14 providing a hinged connection between the elements.

The tubular member 51 is secured to the ring 37 at the elongated annular relief 43 and the cap 53 secured to the end of the tubular member.

Finally, the plug 16 is then threaded into the aperture 23 of the disc 15 until the stop surface 25 becomes secure against the planar surface 21 of the disc. To tighten the plug into the aperture 23 the ring 37 is moved away from the plug support surface 29 against the force of the looped elastic member 56 to expose the detents 31. An appropriately sized spanner wrench may then be utilized to secure the plug to the disc.

Should replacement of a loop become necessary the plug 16 is simply removed from the disc, the retainer pins removed, the new loop 56 inserted and the retainer pins re-inserted. To facilitate this procedure, a removable cap 53 or removable tubular member 51 is desirable.

As can be appreciated, a signal device has been provided which includes a tensioned elastic member yieldably supporting a warning standard upon a base and which provides for easy assembly of the device and simplified installation of the tensioned member. In addition the tensioned member is securely connected to the base and standard to provide prolonged effectiveness even under exposure to adverse traffic conditions.

Various features of the invention have been particularly shown and described. However, it must be appreciated that various modifications may be made without departing from the scope of the invention.

What is claimed is:

1. A signal device comprising:

- a base adapted to be secured to the surface of a roadway, said base including a removable plug portion defining a planar support surface,
- a elongated standard adapted to provide a warning signal, said standard being yieldably retained upon said planar support surface of said plug portion to allow deflection of said standard upon impact,
- and a connector including a tensioned elastic member formed to define a continuous loop, said loop being connected between said standard and said plug, deflection of said standard causing elongation of said loop increasing the tension thereof to provide a restoring force to return said standard to said retained position upon said planar support surface.

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2. A signal device as claimed in claim 1 wherein said base includes a bottom wall and a generally conical surface extending therefrom terminating in a stop surface, said base defining a threaded aperture opened at said stop surface, and wherein said plug includes a threaded portion secured within said threaded aperture and a generally planar surface contacting said stop surface.

3. A signal device as claimed in claim 1 wherein the internal circumference of said loop is less than twice the distance between said connection to said base and said connection to said standard.

4. A signal device as claimed in claim 2 wherein the circumference of the internal surface of said loop when in its relaxed state is less than twice the distance between the points of contact of said internal surface of said loop with the portion of said retainer pins spaced furthest from said reaction surfaces.

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