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Williams

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[54] **MARKER POSTS**

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[52] **U.S. Cl.** **404/10**

[51] **Int. Cl.** **E01f 9/01**

[58] **Field of Search** 404/9, 10, 6

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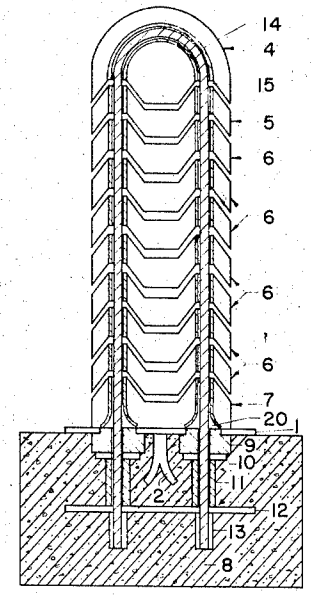
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Primary Examiner—Nile C. Byers, Jr.

[57] **ABSTRACT**

Road marker posts are known which are resiliently bendable on impact therewith by a vehicle, thereby minimising the effects of such collisions. In this invention the post member is constructed of a plurality of post portions united together by means of a steel cable, thereby providing a post member with great resilience and strength. Should the post be destroyed on being run over by a vehicle it separates into a plurality of post portions which present much less a hazard to vehicles and pedestrians than those known marker posts in which this feature is not incorporated. Two alternative design of base means are described which enable a post of this type to be attached to any kind of road surface by the use of either one or the other.

3 Claims, 8 Drawing Figures



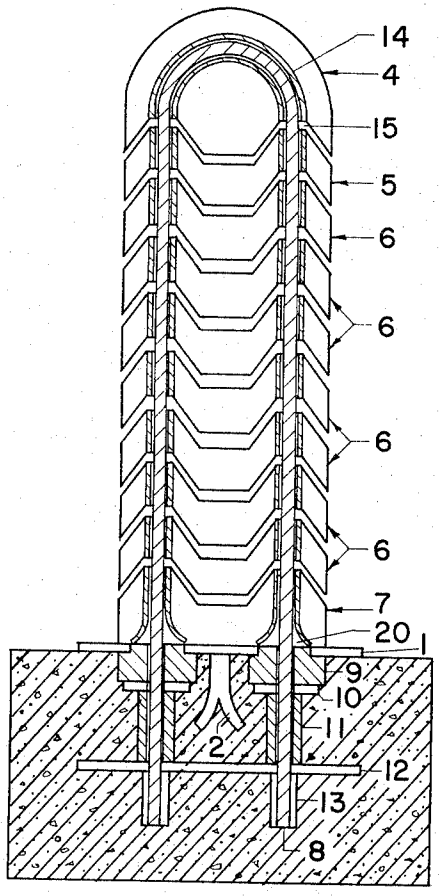


FIG.1

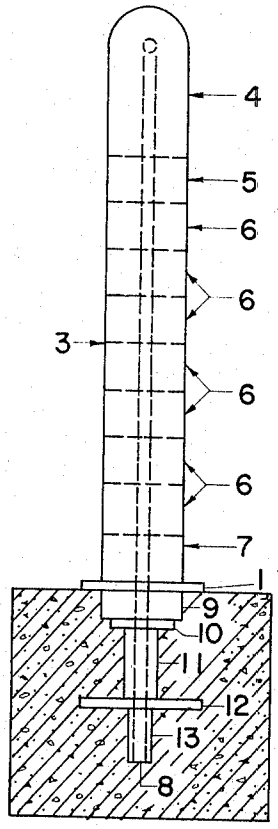


FIG.2

FIG.3

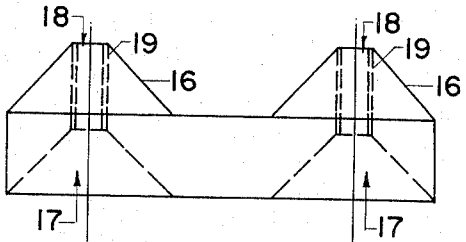
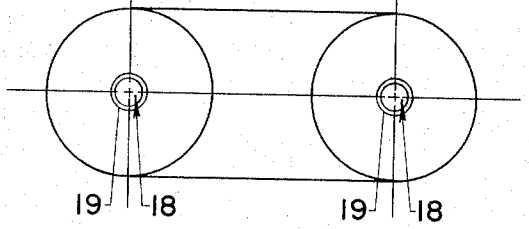


FIG.4



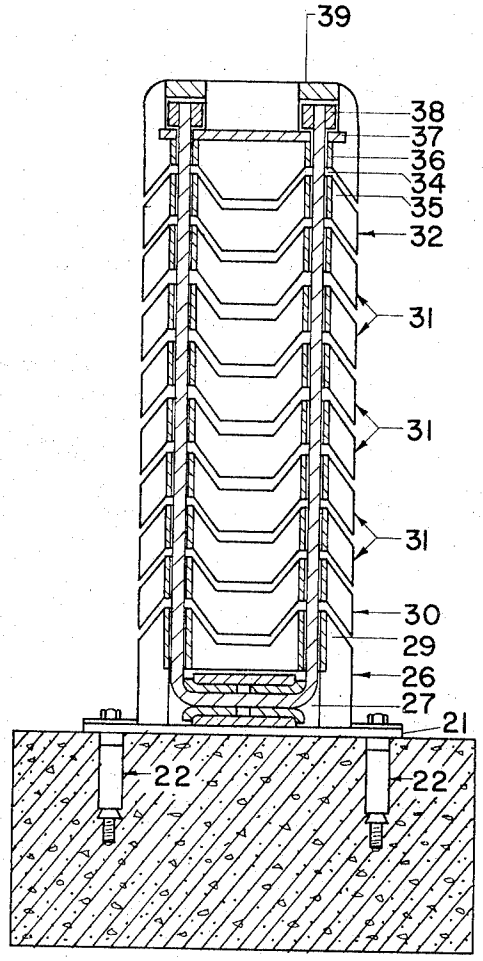


FIG. 5

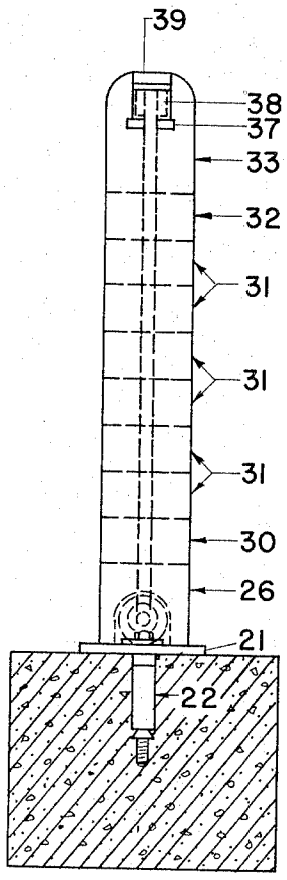


FIG. 6

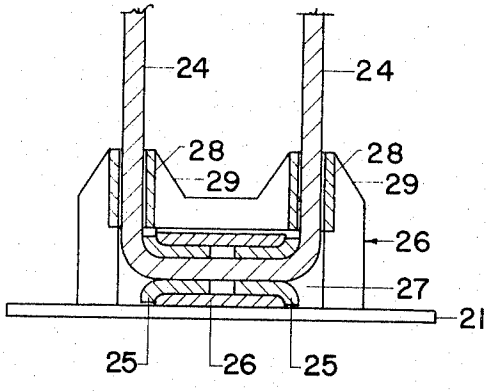


FIG. 7

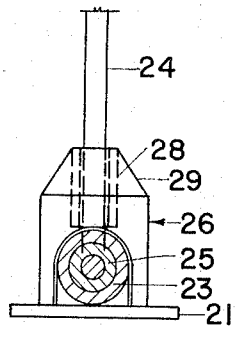


FIG. 8

MARKER POSTS

The invention relates to yieldable posts for the sign-posting and organisation of road traffic, and for the purpose of acting as resilient posts which may be mounted in or on the road surface and thereby give an audible warning of a hazard ahead by impact with the front and underside of the vehicle.

It is envisaged that such a device would be repeatedly struck by traffic, and it is the object of the present invention to provide a resilient post which will present a minimum of hazard to vehicles and pedestrians, and have long service life under such conditions.

Yieldable marker posts are known which deflect on collision therewith by a vehicle this reducing the risk of damage to the vehicle and other possible dangerous consequences. However, these can be torn away from their base mountings or otherwise severely damaged on being run over by a vehicle, and thereafter constitute a hazard to vehicles or pedestrians using the road particularly if the posts are of substantial size. This disadvantage is substantially reduced by forming the post member of a plurality of post portions united together by means of one or more elongate flexible core elements passing through passageways formed in the respective post portions, the said post portions being freely separable from one another upon detachment of the post from the base member. Thus if the post is torn away from the base means upon being run over it will separate into its relatively small component parts which will constitute much less a hazard. Obviously the greater the number of post portions making up the post the more marked this effect will be; preferably, therefore the post is made up of several, e.g. ten or more, post portions. However if desired the major part of the post may be constructed as an integral shaft, preferably of extruded rubber, and provided with a cap post portion and a base post portion or portions, the portions being united together as aforesaid. Preferably the said elongate flexible core element is a flexible metal cable, galvanised or enclosed in a sheath of a suitable plastics material to minimise the effects of corrosion, or made of a strong and corrosion resistant material such as stainless steel, and may conveniently be in the form of a loop extending over the length of the post, both free ends of the flexible core element being secured either at the base means in the one case, or at the terminal cap segment in the other case, so as to keep the element in tension.

If the said free ends of the flexible core element are secured independently of one another, and provision is made for the turn of the loop to pass through a conduit provided either at the cap segment in the one case or at the base means in the other case, then a further safety feature is thereby introduced into the design of the marker post, as will be made clear by the following considerations.

It is envisaged that the marker post would be placed in line of traffic flow and be subjected to an indefinite number of collision impacts therewith by vehicles travelling at high speeds. With marker posts as previously known used in this manner there is a risk that either the entire post complete with base means may be torn from its anchorage or one or more fragments of the post may be torn away during impact and the whole or a part of such a post unit projected towards other vehicles or pedestrians. The use of a loop construction as previously

described substantially reduces this form of hazard. It is envisaged that a loop of flexible core element would be used with a tensile strength substantially higher than the force required to detach the marker post from its moorings at the ground surface, and that the free ends of the flexible core element are secured by end connections designed to separate from the said flexible core element at a tension substantially lower than that required to detach the said marker post from its anchorage at the ground surface. These conditions can readily be met by the use of high tensile strength steel cable as the flexible core element and the use of metal end connections swaged onto the cable under controlled conditions.

A marker post constructed in such a manner will disrupt if subjected to an impact which exceeds the tensile strength required to separate the end connection from the flexible core element. Necessarily only one end connection will separate from the flexible core element, since the instant that separation occurs tension is automatically released from the other end connection. The flexible core element must then unthread through all of the post segments before any of the post segments can be completely separated one from another. The energy of collision is thus disrupted and dissipated in this unthreading process and projection of the fragments thereby minimised. If so desired the turn of the loop of the flexible core element can be accommodated within a conduit formed of a deformable material such as malleable copper or aluminum, which deforms during impact and thereby grips the flexible core element, providing some further measure of resistance during the unthreading process so as to enhance the dissipation of collision energy still further.

The post portions may take any of a variety of forms. Thus they could comprise thick disc-shaped members, part-spherical shell-like members, or indeed hollow truncated cone-shaped members, the outer conical surface of one portion engaging with the inner conical surface of the adjacent portion. Preferably, however, especially when the core element is in the form of a loop as aforesaid, or when two or more core elements are being provided, being spaced apart over the breadth of the post, the post portions are in the form of blocks whose cross-section corresponds to the desired cross-section of the post, and which are provided on opposite faces thereof with two or more shaped projections and two or more shaped recesses, it being understood that on assembly the said projections will locate in the corresponding recesses. Preferably the projections and recesses will be of conical or frustoconical form, said recesses being provided on one of said faces and said projections on the other. Passageways which may be reinforced, for the core elements may then be provided in the post portions, extending between the apices of the projections and recesses.

It is not necessary for all of the post portions to be identical. Indeed it will generally be advisable to provide a cap member, possibly with recesses or projections arranged to co-operate with its adjacent post portion, which cap member may be provided either with means for making fast one or both ends of the or each core element, or may have a reinforcing U-tube, of metal or plastics, embedded therein which serves to accommodate the turn of the loop. Again, in order to give the post greater flexibility near the base, post portions of reduced thickness or greater resilience as compared

to the portions in the main body of the post may be provided in the base region.

Although the post portions may, if desired, all be made of rubber, preferably hard rubber, or some other hard wearing resilient material such as a suitable synthetic plastics material, some may be of non-resilient material such as hard plastics material or metal. Thus portions of resilient and non-resilient material may be arranged at different regions of the post in order to provide a variation in properties along the length of the post.

Marker post units according to the invention may be provided with a patterned, lettered, coloured, fluorescent or reflective surface and be made of any suitable cross-section or height, or if desired be fitted with a cap or sheath of a particular design, or be provided with a reflective element or elements embedded or recessed into the outer surface or surfaces of the elements of the post unit, or any combination of these features according to the uses and situations in which it is intended to be used.

The preferred method of anchoring the flexible post to the ground is related to the nature of the material of which the ground surface layer is composed. Accordingly two types of base means are described which permit the post to be secured to any type of road surface by the use of either one or the other.

The drawings attached to the present specification will help to better understand the invention, as examples only.

FIG. 1 is a sectional front elevation through a marker post unit according to the invention with a base means designed for embedment in the ground. In this view the post portions are shown as if slightly separated from one another in partially exploded view.

FIG. 2 is a side elevation view of the post unit of FIG. 1 with the post portions shown in apposition to one another.

FIG. 3 is a front elevation view of a post portion of the unit of FIG. 1.

FIG. 4 is a plan view of a post portion of the unit of FIG. 1.

FIG. 5 is a sectional front elevation through a marker post unit with a base means designed for attachment to the ground by means of bolts. In this view the post portions are shown as if slightly separated from one another in partially exploded view.

FIG. 6 is a side elevation view of the post unit of FIG. 5 with the post portions shown in apposition to one another.

FIG. 7 is an enlarged view of the base of FIG. 5.

FIG. 8 is an enlarged view of the base of FIG. 6.

FIGS. 1 and 2 show a yieldable marker post unit comprising a base plate 1 made from a portion of steel plate. A metal rod 2 with its distal end expanded in the form of an inverted Y arises from the midpoint of the lower surface of the base plate 1 and serves to secure the base plate 1 firmly when the post unit is embedded in the ground. Connected to the base plate 1 is a post, generally indicated at 3, which comprises a plurality of resilient hard rubber post portions 4, 5, 6 and 7 united together by an elongate flexible core element in the form of a steel cable 8 having the form of a loop extending over the length of the post 3. The ends of the cable 8 pass through passageways in hard rubber washers 9 embedded in and below the base plate 1 and through metal washers 10 and spacer sleeves 11 before passing through a metal flange 12. The free ends of the cable 8 are secured under tension by collars 13 of aluminum compressed onto the cable 8 by the use of a suitable press.

The uppermost or cap, portion 4 is generally in the form of a transversely flattened hemisphere and has embedded in it a hollow reinforcing U-tube 14 of aluminum. This U-tube 14 is to transmit the stress imparted by the tension in the cable 8 to the remaining post portions. The lower face of the cap portion 4 is provided with two cone-shaped recesses 15 which are adapted to receive the two cone-shaped projections 16 provided on the upper surface of shaft post portion 5, as seen better in FIGS. 3 and 4. Turning for the moment to FIGS. 3 and 4, it will be seen that shaft post portion 5 comprises a block whose cross-section is elongate, having two opposite longer sides and rounded ends. Two conical recesses 17 corresponding with projections 16 are formed in the lower side of the block, the apices of the respective recesses and projections being joined by a cable passageway 18 which is lined with metal tubular reinforcement 19. Shaft post portions 6 are identical in construction with shaft post portion 5. The lowermost post portion 7 in contact with the base plate 1 has at the point where the cable 8 passes from the rubber washer 9 into the post portion 7 a reinforced coneshaped recess 20 which allows the cable 8 to take the form of a smooth curve in contact with the lowest post portion 7 when the post is bent over at an angle at the base, thus tending to minimise stress on the cable 8 at this point.

The post unit is erected by embedding the base means in concrete up to the level of the base plate 1 within a hole of suitable size prepared in the ground, the flange 12 then acting as an anchor which effectively restrains the post from being uprooted on impact by a vehicle.

FIGS. 5, 6, 7 and 8 represent an example of a post with an alternative design of base means. In this example the base means is in the form of a flat steel plate 21 suitably perforated so that bolts, generally indicated at 22, may be passed through it and into the road surface so as to anchor the plate 21 securely flush with the ground. Alternatively the plate may be secured to the road surface with a suitable adhesive, such as epoxy resin. To the upper surface of plate 21 is affixed a hollow steel cylinder or conduit 23 which serves as a passageway for the turn of the loop of the flexible steel cable 24 forming the core element. Metal or hard plastic bushes 25 which are free to rotate within the conduit 23 and which protrude for a short distance from its ends serve to guide the cable 24 in a smooth curve as it emerges from the conduit, and act as bearing surfaces between the conduit 23 and the cable 24 when the flexible post is bent over at the junction between the lowest post segment 26 and the base means 21. The lowest post segment 26 contains in its lower surface a recess 27 which is reciprocally shaped to conform with the shape of the conduit 23 and its bushes 25, which are enclosed within the said recess when the post is assembled. The two ends of the cable 24 pass upwards into the body of the lowest post segment 26, and through reinforced passageways 28 at the lateral aspects of the lowest post segment 26, emerging from its upper surface each at the apex of a laterally placed conical protrusion 29 which is received into a reciprocally shaped

recess in the lower surface of the next post segment **30.**

The body of the post is composed of segments **30, 31** and **32** identical in construction with post segment **5** of the previous example.

The cap member **33** of the post unit is designed so as to permit the two ends of the cable **24** to be anchored therein, and is of a cross-section corresponding with that of the body of the post. The lower surface of cap member **33** contains two conical recesses **34** reciprocally shaped so as to correspond with the two conical projections **35** arising from the upper surface of the uppermost post segment **32.** The two ends of the cable **24** pass upwards through segments **30, 31** and **32** and enter corresponding channels **36** each at the apex of a coneshaped recess **34** in the lower surface of cap member **33.** Channels **36** conduct the ends of cable **24** through corresponding holes in a steel plate **37** embedded in the body of cap member **33** and lying transversely and above the recesses **34.** The steel plate **37** serves to transmit the stress imparted by the tension in the cable **24** secured above it to the rest of the post portions. The channels **36** are expanded in the region above the level of the steel plate **37** and emerge on the upper surface of the cap member **33.** This expansion serves to accommodate collars **38** of aluminum secured by compression to the cable ends. During assembly one collar **38** is secured to one end of a length of cable **24** which is then threaded through the component parts of the flexible post unit, and the free end allowed to protrude from the upper surface of the cap member **33.** The post unit is then externally compressed in a longitudinal direction, the second collar **38** secured in position on the cable **24** and surplus cable end trimmed. On releasing the external compression of the post unit the secured cable ends are withdrawn into the body of the cap member **33.** The residual spaces above the collars **38** are then filled by rubber plugs **39** coated with a suitable adhesive and inserted in position.

While there have been shown and described particular embodiments of this invention, it will be obvious to those skilled in the art that various changes may be made therein without departing from the invention, therefore, it is intended in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

Having thus described my invention;

What I claim is:

1. A road marker comprising:

a base adapted to be secured to the surface of a roadway; an elongated standard made up of a plurality of post portions and a cap segment; at least one of the post portions being formed of a resilient plastics material; the cap segment, post portions and base being united together by means of a loop of a flexible core element passing through passageways formed within them; the ends of the flexible core element being secured independently of each other.

2. A marker post as claimed in claim **1,** in which the turn of the loop is accommodated within the cap segment, the ends of the loop then passing downwards through passageways in the post portions, then through passageways in resilient washers embedded in and below a base plate, and then through nonresilient washers and spacer sleeves before passing through apertures in a flange, the ends of the flexible core element then being secured below the said flange.

3. A marker post as claimed in claim **1,** in which the turn of the loop is accommodated within a conduit attached to a plate; the plate having holes through which attachment devices may be passed so as to secure the plate to the ground surface; the ends of the loop then passing upwards through passageways formed in the post portions forming the body of the post; the lowest post portion containing within its lower surface a cavity reciprocally shaped so as to enclose the conduit; the cap segment containing a plate perforated so as to allow passage of the ends of the flexible core element; the ends of the flexible core element being secured above the plate.

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