United States Patent [19]

Pinter

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[45] **Oct. 30, 1973**

[54] **REFLECTIVE MARKER DEVICE**

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[73] Assignee: **American Reflector Co., Inc.**, Grafton, Wis.

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[52] **U.S. Cl.** **116/63,** 40/39, 116/28, 240/70, 248/125, 350/97, 350/99, 350/104

[51] **Int. Cl.** **E01f 9/10**

[58] **Field of Search** ..... 116/63, 63 P, 114, 116/28, 173; 40/39, 40, 41; 350/97, 98, 99, 104, 106, 107, 307; 248/221, 337, 226, 326, 230, 125, 226 D, 226 E, 245, 280; 240/70, 151

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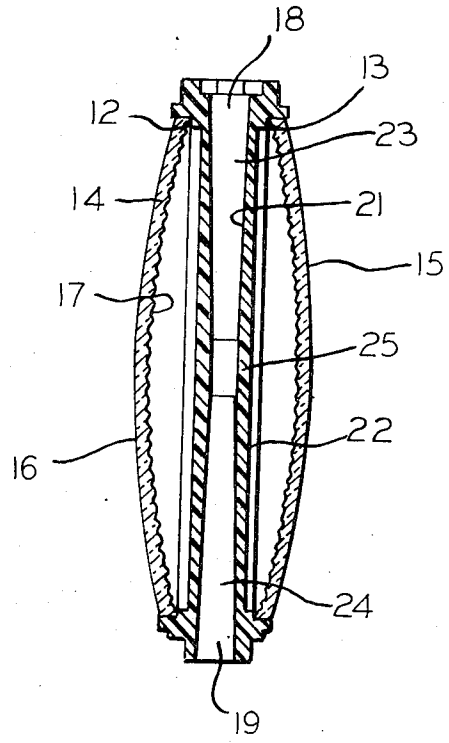
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Attorney—Ralph G. Hohenfeldt et al.

[57] **ABSTRACT**

A marker comprises an annulus having a circumferential groove on each edge to receive reflective lenses which face in opposite directions. There are diametrically opposite apertures in the wall of the annulus for installing it on a rod or stake. Friction creating surfaces are interposed in the path of the rod within the annulus to prevent it from sliding on the rod unless forced. In one embodiment a tube that is tapered from both ends and extends diametrically between apertures produces the friction. In another embodiment spring-like plastic members in the annulus bear on the rod to produce friction. Means are provided for stacking markers at different angles on a stake.

10 Claims, 7 Drawing Figures



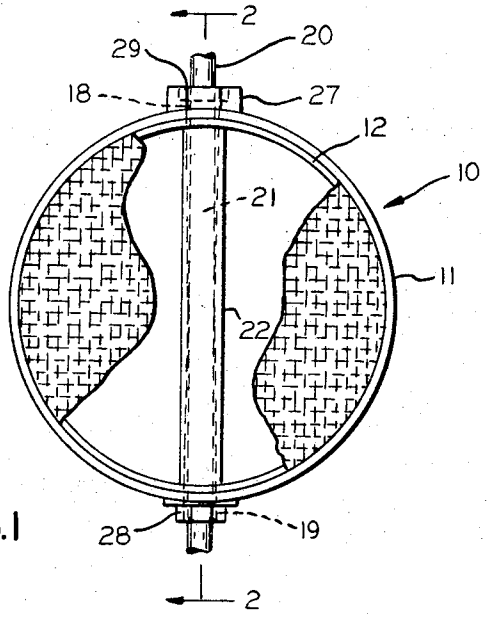


FIG. 1

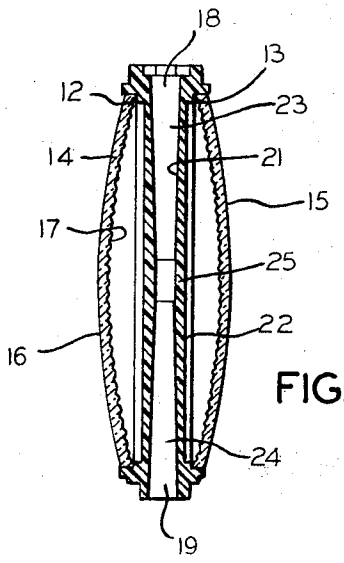


FIG. 2

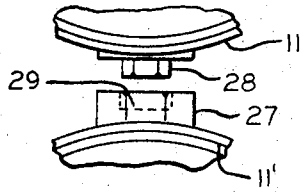


FIG. 3

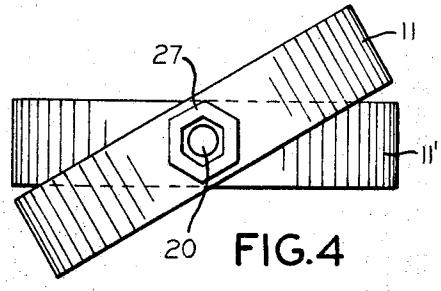


FIG. 4

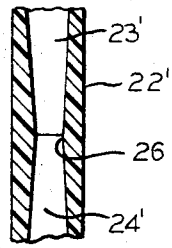


FIG. 5

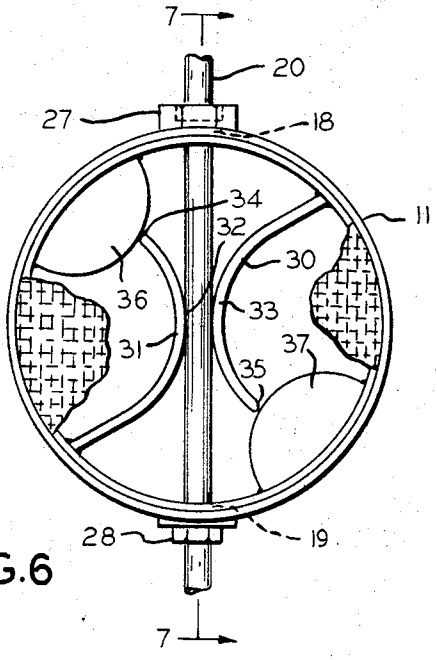


FIG. 6

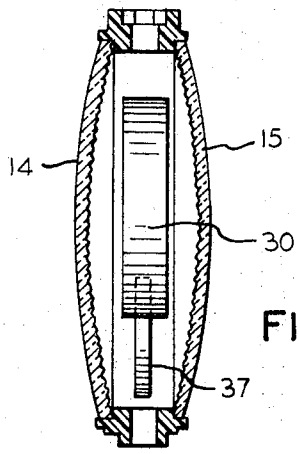


FIG. 7

REFLECTIVE MARKER DEVICE

BACKGROUND OF THE INVENTION

This invention relates to reflective marker devices such as are used to mark the boundaries of a road or driveway. A number of such reflector devices may be installed on a stake and oriented in different directions so that at least one of them will reflect brightly toward an observer when illuminated by automobile headlights, for example.

SUMMARY OF THE INVENTION

In general terms, the new reflective marker comprises a frame which is preferably a plastic ring or annulus that has circumferential recesses in its opposite edges for receiving reflective prismatic lenses made of plastic. The lenses face in axially opposite directions. The annulus is apertured at diametrically opposite places so that it can be installed on a rod or stake and angulated so as to reflect in a selected direction. There are means within the annulus for engaging the rod or stake frictionally so that the annulus will not slide or turn freely on the rod. In a preferred embodiment, the friction producing means comprises a plastic tube extending diametrically across the interior of the annulus. The tube bore is tapered from opposite ends toward its center which thus has a reduced diameter slightly less than the diameter of the stake. This produces frictional engagement when the reflector assembly is installed on a stake. In another embodiment, there are plastic spring members within the annulus with a gap between them for passing the stake therethrough and frictionally engaging it. Means are also provided for interlocking one reflector with another on the same stake to maintain a fixed angular relationship between them.

Objects of this invention are to provide a reflective marker which is simple in construction, inexpensive to manufacture and which can be installed on a stake easily and quickly in the manufacturing plant with minimum caution on the part of the assembler as to whether the stake is properly aligned with the apertures of the annulus.

How these and other more specific objects of the invention are achieved will appear in the more detailed description of illustrative embodiments of the invention which will be set forth shortly hereinafter in reference to the drawing.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front elevation view of a marker device with the lenses broken away to show the interior thereof;

FIG. 2 is a vertical section taken on a plane corresponding with 2—2 in FIG. 1 with the supporting stake omitted;

FIG. 3 shows fragments of two axially adjacent marker devices to illustrate the manner in which they are angularly interlocked;

FIG. 4 is a top view of two marker devices on a stake;

FIG. 5 is a fragmentary section of an alternative form of the means for frictionally engaging the marker device with a stake;

FIG. 6 is a front elevation view of an alternative embodiment of the marker device with the lenses broken away to show the interior thereof; and

FIG. 7 is a vertical section taken on a plane corresponding with 7—7 in FIG. 6, the supporting stake being omitted.

DESCRIPTION OF A PREFERRED EMBODIMENT

The marker device **10** in FIGS. **1** and **2** comprises a frame which is desirably an annulus **11** that is made of rigid plastic or other suitable material. The edges of the annulus are recessed so as to provide circumferential shoulders **12** and **13** on opposite sides. Lenses **14** and **15** are pressed into the annular recesses. A few spots of adhesive may be applied to the edges of the lenses or in the recess to fix the lenses in place.

Lenses **14** and **15** are made of transparent plastic and they are preferably colored. The lenses have a smooth outer face and the inner face **17** is provided with a myriad of small integrally molded prisms which are so oriented that they redirect light impinging on the lens face back towards the source thus making them very noticeable at night.

In FIGS. **1** and **2** one may see that there are apertures **18** and **19** which extend through annulus **11** on diametrically opposite sides thereof to facilitate placing the annulus on a stake **20** which may be a round steel rod. Extending diametrically across the interior of annulus **11** with its bore **21** aligned with apertures **18** and **19** is a tube **22** which is integrally molded with the annulus. Tube **22** facilitates assembly of the annulus onto a rod or stake **20** since when the end of the stake is started through one aperture such as **18** it will be guided directly across the annulus by the tube to pass out of the other aperture **19** without any special care being exercised by the assembler to get the end of the stake **20** to line up with the other aperture.

Note in FIG. **2** that the bore **21** of the tube **22** is tapered from opposite ends for various reasons including making it easier to start in either direction over the end of stake **20** during factory assembly. Thus, the diameter of apertures **18** and **19** at the end of the tube may be a little larger than the diameter of stake **20** in which case the assembler can get the rod started in guide tube **22** easily. The tapered portions of the tube **22** are marked **23** and **24**, respectively. These tapered portions are joined by a cylindrical portion **25** whose diameter is preferably a few thousandths of an inch less than the diameter of stake **20.** Thus, the undersized cylindrical portion **25** of the bore **24** constitutes a surface for frictionally engaging the reflector on stake **20.** The frictional force is adequate to maintain the device at any desired elevation or angular orientation on stake **20.** The oppositely tapered cylindrical bore **24** may be created by known molding techniques wherein generally tapered retractable pins in the molds, not shown, which form the bores have cylindrical ends that butt each other axially during molding of the annulus.

In FIG. **5** an alternative form of tube **22** is marked **22'**. Other corresponding parts are also given primed numerals. In this case the tapers **23** and **24** converge toward each other and intersect at **26** so as to create a reduced diameter region or line thereabout which constitutes a friction surface for engaging stake **20** when it is passed through tube **22'**.

As mentioned earlier, a number of reflector assemblies **10** may be stacked axially on stake **20** at different angular orientations about the axis of the stake. Means are provided for locking the devices at a definite angular relationship with respect to each other. These

means, in this example, constitute a pair of bosses **27** and **28** which are molded integrally with annulus **12** and have the stake receiving apertures **18** and **19**, respectively, extending through them. At least one of the bosses such as the lower one **28** preferably has a hexagonal exterior. The upper boss **27** has a mating hexagonal recess **29** which makes a close fit with the hexagonal exterior of lower boss **28**. Thus, as can be seen in FIG. **3**, a hexagonal boss **28** extending from one annulus may be inserted or registered in a mating hexagonal hole **29** in a boss **27** which extends from another annulus. The hexagonal shape of these interlocking elements permits several axially adjacent reflectors to be stacked on the same rod oriented at different angles with respect to each other. One may see in FIG. **4**, for instance, how two different reflector devices **11** and **11'** are interlocked at an angle of 45° with respect to each other on stake **20**. With hexagonal bosses and corresponding recesses, it is possible to angulate the reflectors in various vertical planes.

In the embodiment of FIGS. **6** and **7**, parts which are similar to those mentioned in connection with discussing FIGS. **1–5** are assigned similar reference numerals. In this embodiment, the frame or annulus **11**, lenses **14** and **15**, and the bosses **27** and **28** are essentially the same as the embodiment just discussed in connection with the other figures. In FIGS. **6** and **7** one may see that there are a pair of flat spring elements **30** and **31** molded integrally with plastic annulus **11**. These spring elements are curved and have opposed friction engaging surfaces **32** and **33**. When stake **20** is removed, the inherent resiliency of flat springs **30** and **31** urges the friction engaging surfaces **32** and **33** rather close to each other but with a gap between them which is smaller than the diameter of stake **20**. Of course, when the rod is forced through the annulus **11** the flat springs **30** and **31** resist being spread apart and thus produce a frictional force on the surface of the stake **20** which they contact tangentially. The free ends **34** and **35** of springs **31** and **30**, respectively, react against semicircular disks **36** and **37** which are molded integrally with annulus **11** and extend radially inwardly therefrom. In this embodiment, tube **22** is omitted and, of course, more difficulty is experienced by the assembler when attempting to install the annulus on a stake **20** since when the end of the stake is started through one aperture **18** and into the annulus it is necessary to line up the end with the other aperture by sighting into the annulus or by feel. This is time consuming and reduces the number of pieces that can be assembled manually in a given period of time.

Although the preferred embodiment of FIG. **1** and the alternative embodiment of FIG. **6** have been described in considerable detail, such description is to be considered illustrative rather than limiting, for the invention may be variously embodied and is to be limited only by interpretation of the claims which follow.

I claim:

1. A marker device comprising:

a. a lens supporting frame having at least a pair of aligned apertures defining a path for a rod,

b. means including a friction generating surface in said frame which surface is adjacent a rod receiving path to enable frictional engagement with a rod and to secure the frame thereon in a selected position,

c. tubular means interposed between said apertures interiorly of said frame, said friction generating surface being within said tubular means.

2. The invention set forth in claim **1** wherein;

a. said tubular means extends across the interior of the frame between said apertures, said tubular means having an axially tapered bore the smallest diameter part of which comprises said friction generating surface.

3. The invention set forth in claim **1** wherein;

a. said tubular means extends between said apertures interiorly of said frame, said tubular means having axially aligned tapered bores converging toward each other from opposite ends of the tubular means, the region of convergence of said bores comprising said friction generating surface.

4. The invention set forth in claim **1** including:

a. boss means on opposite sides of said frame means, said boss means having apertures aligned with the apertures in the frame means,

b. at least one of said boss means having a recess surrounding its aperture, the other boss means being of such external size and shape as to be receivable in said recess, to thereby enable interlocking of adjacent frames with each other.

5. A marker device comprising:

a. an annulus having circumferential recesses in its opposite edges for accommodating reflective lens means and said annulus having substantially diametrically opposite apertures therein,

b. tubular means extending substantially diametrically across said annulus and having an axial bore aligned with said apertures,

c. the axial bore being tapered convergingly in directions away from the opposite apertures to produce a region of reduced diameter for frictionally engaging a suitably sized rod that may be passed through said bore.

6. The marker defined in claim **3** including:

a. interlock means projecting from one side of the annulus and mating receiving means on a substantially diametrically opposite side of said annulus, whereby the projecting interlock means of one annulus may be received in the mating receiving means of another similar annulus to position said annuli at selected angles with respect to each other.

7. A marker device comprising:

a. a lens supporting frame means having at lease a pair of apertures defining a path for a rod,

b. curved spring means in opposed relation to each other within said frame means, corresponding spaced apart surfaces of said spring means constituting friction generating surfaces, the space between said spring means allowing for passing a rod through said apertures and frame means whereby to oppose the resilient force of the spring means and thereby engage the rod frictionally.

8. The invention set forth in claim **7** wherein:

a. said spring means each having their corresponding one ends fastened to said frame means and each spring means having a free end,

b. means extending from said frame means into the vicinity of each of the free ends, whereby when the spring means are parted by a rod passing between them said spring means react against said extending means.

9. A marker device comprising:

a. frame means for supporting a lens,

b. means for frictionally engaging said frame means to a shaft,

c. means projecting from one exterior side of said frame means and a recess in another side of said frame means, said projecting means having such external size and shape as to be registrable in said recess to thereby enable interlocking adjacent

frames with each other.

10. The device set forth in claim **9** wherein:

a. said projecting means and said recess are both polygonal in cross section, whereby to enable adjacent frames to be engaged and maintained in predetermined angular relationship with each other.

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