

Feb. 18, 1941.

K. W. FLOCKS

2,232,023

MARKER

Filed April 28, 1939

Fig. 1.

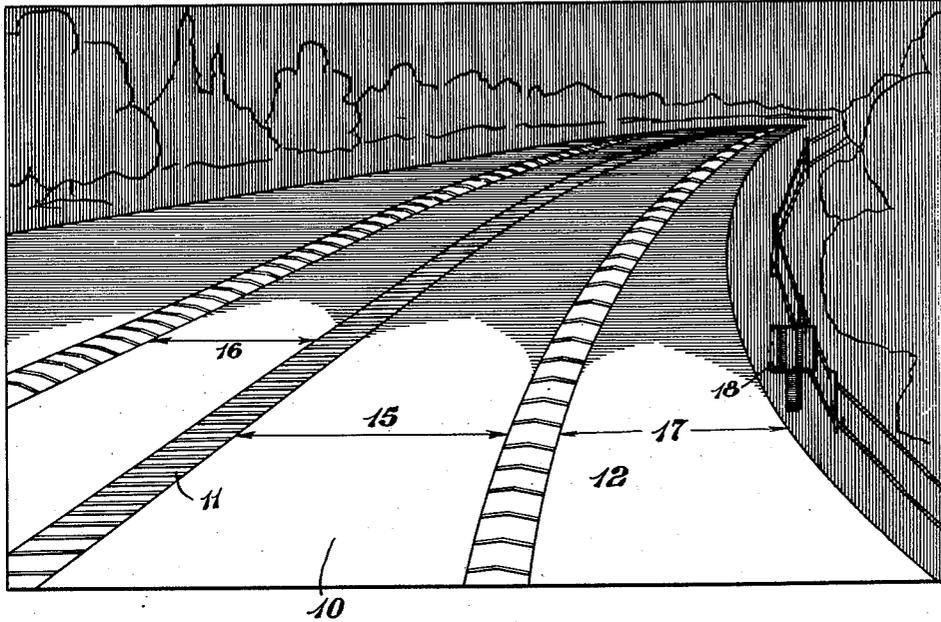


Fig. 2.

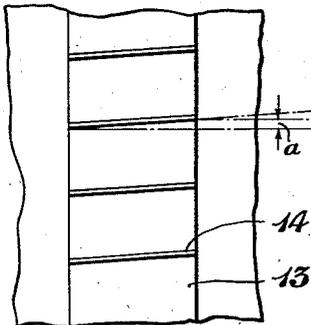
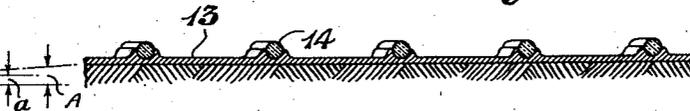


Fig. 3.



3

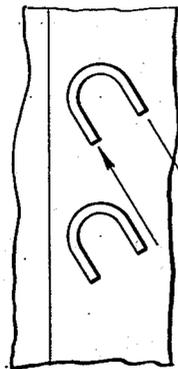


Fig. 6.

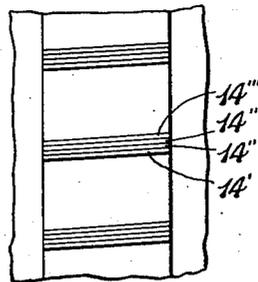


Fig. 4.

Inventor

KARL W. FLOCKS

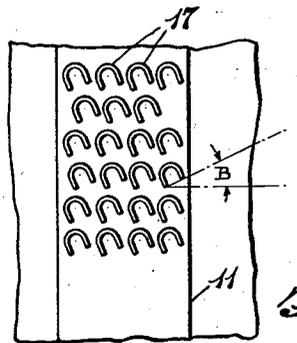


Fig. 5.

334

Attorney

UNITED STATES PATENT OFFICE

2,232,023

MARKER

Karl W. Flocks, Washington, D. C.

Application April 28, 1939, Serial No. 270,636

7 Claims. (Cl. 94—1.5)

This invention relates to road markers and more particularly to road markers incorporating a paint or binding medium and a series of auto-collimating units.

5 Prior to the instant invention, it has been contemplated that glass spheres, three cornered reflectors, heterogeneous shaped units, and similar reflecting and refracting units be incorporated in a pigmented binder to provide a marker suitable for use as a center line on highways for example. These prior arrangements have been hit or miss, heterogeneous, wasteful of material, relatively low in efficiency, and high in cost.

10 It is an object of the instant invention to provide an economical road marker comprising paint or other pigmented binding medium and transparent rods.

15 It is a further object of the instant invention to provide a marker comprising a film of paint or other pigmented binder incorporating a plurality of transparent rods arranged in accordance with a predetermined plan whereby a marker of very high efficiency and low cost is effected.

20 Other objects and the nature and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawing, wherein:

25 Fig. 1 is a view in perspective of a highway including markers in accordance with the instant invention;

Fig. 2 is a fragmentary plan view of a center line marker in accordance with the invention;

30 Fig. 3 is a sectional view taken along line 3—3 of Fig. 2;

Fig. 4 is a view similar to Fig. 3 but of a modified form of marker;

35 Fig. 5 is a view similar to Figs. 3 and 4 of a still further modified form; and,

Fig. 6 is an enlarged fragmentary plan view of the form of the invention illustrated in Fig. 5.

40 Referring to Fig. 1, a road or highway 10 has applied thereto a center line 11 and an intermediate lane line 12. The center line 11, see Figs. 2 and 3, comprises a paint or pigmented binder 13 of a formula in accordance with the copending application Serial Number 274,666, which paint or binder is adapted to securely hold, in proper optical relation to light received from an automobile headlamp, the transparent rods 14, which can be of glass or other inorganic or organic material such as "Lucite" for example. These rods may be spaced as best illustrated in 45 Fig. 3. It is preferred that for a four inch center

line the rods occur every one to six inches, more or less.

5 Though the rods are generally applied transversely of the center line, they are actually at slight variance to the perpendicular to the center line. For example, with a four inch center line, the quantity *a*, see Fig. 2, may be approximately one-fourth to one-half inch, more or less, depending on the width of the lane 15.

10 The paint or pigmented binder is preferably of such chemical and physical nature as to securely bond the rods 14 to the center line and hold the same about the lower half of their individual areas as best illustrated in Fig. 3. This relationship between the rods and the binder insures long life and proper reflecting efficiency whereby reflection will take place in the desired auto-collimating manner as indicated by the arrows representing light rays.

15 After a relatively long period of wear some of the rods may become dislodged from the binder and in order that a minimum replacement be required the rods may be applied in bundles or sets of three or four as illustrated in Fig. 4. In this form of the invention should the rod 14' be dislodged after continued wear, the rod 14'' will come into play, insuring continuous high reflecting efficiency of the center line. Similarly, after further continued long wear the marker 14''' will come into efficient light receiving, refracting and reflecting position and then finally the marker 14'''' will be fully exposed and will operate in the same manner described in connection with the rods 14 illustrated in Figs. 2 and 3. The life of such a line will of course be relatively long with accompanying high reflecting efficiency.

20 The rods themselves will be of a length corresponding to the width of the marker to which they are applied and of a diameter ranging from approximately 0.005 inch to 0.040 inch in diameter and as their axis is generally transverse to the axis of the marker but not perpendicular thereto, there being the slight angle "A" inherent in the arrangement, the light from a vehicle traveling alongside the marker in the lane 15 will travel to the center line 11 and be reflected back thereto. Similarly a vehicle traveling in the lane 16 but in the opposite direction 25 will also have light from its headlamps reflected back to it.

30 It is to be understood that it is proposed to select binders which have special affinity for the material of the rods and that the binder may 35

even contain a solvent holding medium to effect partial welding of the rod thereto.

Not only may rods be incorporated in the binder but when "Lucite" is the material from which the auto-collimating units are fabricated, they may be U-shaped as illustrated in Figs. 5 and 6, "Lucite" having the peculiar property of causing light entering its end to travel along the axis thereof even though the axis be curved as illustrated by the arrows in Fig. 6. The U-shaped "Lucite" rods 11 may be distributed in the center line 11 heterogeneously or systematically with the ends always occurring at an angle "B", see Fig. 5, to the perpendicular to the axis of the marker 11.

In order that light may be properly reflected back to vehicles traveling in the same direction on both sides of a line such as for example vehicles traveling in lane 15, and lane 17, the lane line 12 has incorporated therein the rods 14 in a herringbone pattern. The angular disposition of each rod in the herringbone pattern is the same as that illustrated in Fig. 2.

Not only may the rods 14 be utilized on markers applied to a horizontal surface but they may be incorporated in vertical markers such as the marker 18 which is particularly effective on curves in the highway acting to reflect and refract light back to a source which is at a great angle to the perpendicular to the plane of the marker.

It will be obvious to those skilled in the art that various changes may be made in this device without departing from the spirit of the invention and therefore the invention is not limited to what is shown in the drawing and described in the specification but only as indicated in the appended claims.

What is claimed is:

1. A combined highway and marker comprising a road surface, an elongated strip of pigmented film of predetermined thickness bonded to said road surface, a series of rod-like transparent light returning elements arranged generally transversely of and partially imbedded in said strip so as to return light to a source, said elements being spaced from each other in a direction along the length of said strip.

2. The structure recited in claim 1, the rod-like transparent elements having their axes arranged at a relatively small angle to the perpendicular to the side of the pigmented strip.

3. A combined highway and marker comprising a road surface and an elongated strip of pigmented film bonded to said surface, a series of sets of contiguous rod-like light refracting transparent elements partially imbedded therein, the axes of each set being arranged at a relatively small angle to the perpendicular to the side of the pigmented strip, said sets of elements being spaced from each other in a direction along the length of said strip.

4. A combined highway and marker comprising a road surface, an elongated film-like strip bonded to said surface, a plurality of spaced generally U-shaped rod-like transparent elements of "Lucite" partially imbedded in said pigmented strip, a preponderance of said U-shaped elements having their open ends extending in the same general direction.

5. A combined highway and lane line comprising a road surface, an elongated pigmented strip bonded to said surface, a plurality of U-shaped "Lucite" rods partially imbedded in said pigmented strip, said rods being so arranged in said strip that a line drawn through the ends of the legs of said rods will be at an acute angle to the perpendicular to the side of the said strip.

6. The structure recited in claim 1, the rod-like transparent elements being arranged in partially imbedded relation in said pigmented strip and in herringbone design.

7. A combined highway and lane line marker comprising a road surface, an elongated pigmented film bonded to said road surface, a plurality of light refracting elements at least partially imbedded in said film, each of said light refracting elements including one or more transparent rods of a diameter within a range from 0.005 inch to 0.040 inch, said elements being arranged generally transversely of the axis of said lane line, and each of said elements being axially spaced within the range of from approximately 1 inch to approximately 6 inches.

KARL W. FLOCKS.