United States Patent [19]

Footchkar

[11] **3,799,646**

[45] **Mar. 26, 1974**

[54] **REFLECTOR**

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[52] **U.S. Cl.** **350/97,** 350/103, 350/109

[51] **Int. Cl.** **G02b 5/12**

[58] **Field of Search** 350/97–109; 404/9–16

[56] **References Cited**

UNITED STATES PATENTS

3,450,459	6/1969	Haggerty	350/109

FOREIGN PATENTS OR APPLICATIONS

490,237	8/1938	Great Britain	350/109
972,725	2/1951	France	350/103

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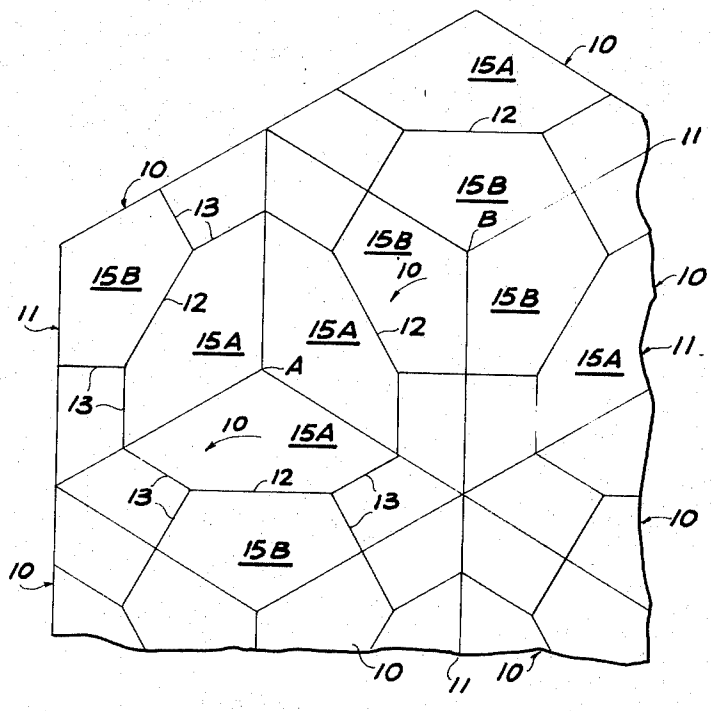
[57] **ABSTRACT**

A reflector such as may be used in the creation of road signs and warning signals and the like comprises the formation of a myraid of rhombic parallelograms each of which in turn has a raised surface consisting of a plurality of flat facets arranged at desirable angles with respect to one another. Three of the faceted rhombic parallelograms are grouped about a common center so as to form a six-sided hexagon. A plurality of such hexagons sufficient to cover a desired area results in a reflector of unusual light reflective capabilities.

7 Claims, 6 Drawing Figures



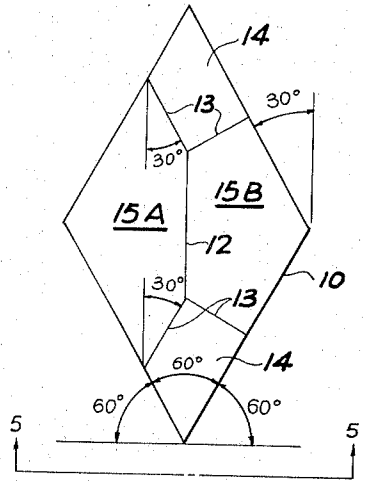


FIG. 1

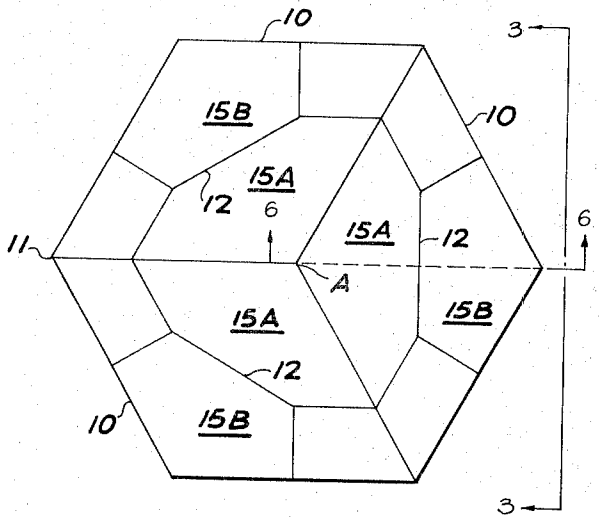


FIG. 2

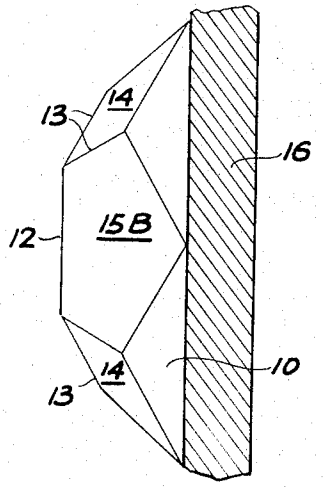


FIG. 3

FIG. 4

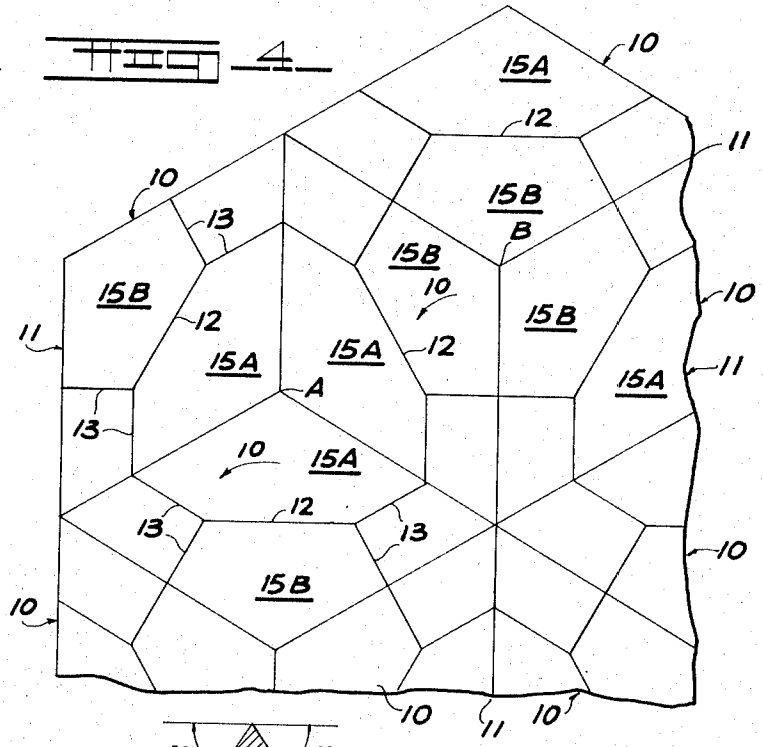
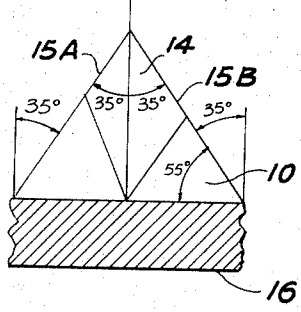


FIG. 5



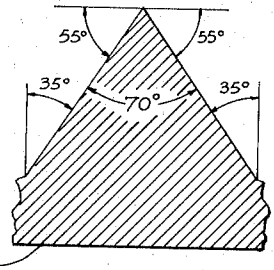


FIG. 6

REFLECTOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to light reflectors in which a plurality of angularly arranged reflective surfaces are employed to reflect light in many directions with respect to its source.

2. Description of the Prior Art

Prior reflectors include triple reflectors which are grouped to form repeating geometric patterns consisting of recurring circular groups of six triple reflectors, the groups repeating in close order and the plan view of each group consisting of a six-sided figure which is a regular hexagon with one side of the triangular base of each six triple reflectors forming a side of the hexagon. Such a reflector is disclosed in U. S. Pat. No. 2,538,638 of January 1951. Groups of hexagon shaped reflective units are seen in U. S. Pat. No. 3,450,459 of June 1969 and still other variations of this type of reflector may be seen in U. S. Pat. Nos. 2,029,375 of February 1936 and 2,357,014 of June 6, 1944.

This invention changes the reflective surfaces of each of the so-called triple reflectors of the prior art by forming each of the reflectors as a rhombic parallelogram having a plurality of angularly disposed flat facets so arranged as to cooperate in light reflecting abilities with other faceted rhombic parallelograms grouped therewith to form hexagons which in turn are part of a continuing group of such hexagons.

SUMMARY OF THE INVENTION

A reflector comprising a structure having a light reflective surface formed in a plurality of recurring circular groups of hexagon shaped elements each of which is formed of three rhombic parallelograms which in turn are provided with multiple angularly disposed facets arranged for light reflective cooperation with one another.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of one of the basic rhombic parallelograms of the reflector showing the plurality of angular facets thereof with degree markings thereon.

FIG. 2 is a top plan view of a group of three of the parallelograms of FIG. 1 arranged in a hexagon.

FIG. 3 is a side elevation on line 3—3 of FIG. 2.

FIG. 4 is a top plan view with parts broken away showing a portion of reflector formed of a plurality of the hexagons of FIG. 2.

FIG. 5 is an end elevation on line 5—5 of FIG. 1 with parts broken away and parts in cross section and

FIG. 6 is a cross sectional elevation on line 6—6 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the form of the invention chosen for illustration the reflector of the invention is comprised of a multiplicity of faceted rhombic parallelograms arranged in hexagons which are in turn arranged in recurring circular groups. In a typical example a reflector having a diameter of approximately 3-½ inches is comprised of hexagons having diameters of approximately an eighth of an inch. The reflector may be formed of various materials including glass and plastics and may be colored if desired. By referring to the drawings and FIG. 4 in particular it will be seen that a small portion of such a reflector has been illustrated in plan view and includes a plurality of multifaceted parallelograms **10** arranged in a plurality of hexagons **11**. Each of the parallelograms **10** has a high center ridge line **12** which ridge line is bifurcated at the opposite ends thereof to form peaks **13**. The ridge line **12** and the peaks **13** divide the upper surface of each of the parallelograms **10** into two equal area facets **14** and two unequal area facets **15A** and **15B** as may best be seen by referring to FIG. **1** of the drawings wherein a top plan view of one of the parallelograms **10** may be seen.

By referring to FIG. **1** of the drawings it will be seen that each of the parallelograms **10** is formed with its sides spaced 60° from a horizontal line and 30° from a vertical line with two of the peaks **13** positioned on 30° angles with respect to a common vertical line so as to form the unequal area facets **15**.

In FIG. **2** of the drawings three of the parallelograms **10** of FIG. **1** are shown in circular assembly to form the hexagon **11** which in turn is repeated in circular grouping in the complete reflector a portion of which is seen in FIG. **6** of the drawings. In FIG. **2** it will be observed that the hexagon **11** formed of the three rhombic parallelograms **10** are so formed that the unequal facets **15A** are in edge to edge relation defining a common center point a which is the center point of the hexagon **11**. The reflective surfaces of the unequal area facets **15A** are disposed at 55° from a horizontal line or 35° from a vertical line as may be seen by referring to the cross section taken on line **66** of FIG. **2** and illustrated in FIG. **6** of the drawings. The high ridge **12** of each of the parallelograms **10** and the abutting edge sections of the unequal area facets **15** form triple reflective surfaces as will be observed by those skilled in the art while the unequal area facets **15B** reflect light in an opposite angular direction as may be seen by referring to FIG. **6** wherein three of the unequal area facets **15B** may be seen to be positioned around a different common center point B and forming the center of a different patterned hexagon **11**. It will thus be observed that the repitition of the parallelograms **10** forms different shaped hexagons **11** depending upon the center of the three parallelograms **10** that is considered. For example in FIG. **6** of the drawings the three unequal area facets **15A** are positioned about the center point A which then becomes the center of a first hexagon **11**. By using one of the same three parallelograms **10** and two adjacent parallelograms the unequal area facets **15B** form a common center point B of a second hexagon **11** with the facets **15B** defining triple reflective surfaces of different reflective capacity as compared with the unequal area facets **15A** heretofore referred to. This pattern repeats throughout a reflective surface formed of a plurality of the parallelograms **10** and their first and second hexagons **11** as will be understood by those skilled in the art.

In other words, adjacent, contiguous surfaces **15A** define one major reflective area; adjacent, contiguous surfaces **15B** define a second major reflective area; and the adjacent, contiguous, trapezoidal surfaces define a third major reflective area.

In FIG. **3** of the drawings the vertical side walls of the parallelogram **10** may be seen connecting with a cross section of a base **16** which extends throughout the area of the reflector as will be understood by those skilled in the art. In FIG. **5** of the drawings an end elevation

on line 55 of FIG. 1 again illustrates the vertical side walls of the parallelogram 10 which walls are angularly disposed as seen in the top plan view of FIG. 1 or the side elevation of FIG. 3 and heretofore described. The underlying portion of the base 16 is shown in cross section.

In a preferred embodiment the basic parallelogram shape as seen in FIG. 1 of the drawings is preferably 0.1250 inches in length and at its widest part is 0.036084 inches on either side of a longitudinal center line which would correspond with the high ridge line 12 as illustrated.

It will thus be seen that a novel and highly efficient reflector has been disclosed and having thus described my invention what I claim is.

1. A reflector comprising a base means, a plurality of side-by-side, juxtaposed rhombic reflector units on said base means and each having opposite side edges, opposite end edges and a plurality of flat, differently angularly disposed light reflective surfaces outwardly inclined from the plane of said base means, said reflective surfaces defined at least in part by a diagonal center ridge line extending between opposite corners of each rhombic reflector but spaced at its opposite ends from said opposite corners, and a pair of peak lines extending laterally in opposite directions from each of the opposite ends of said ridge line to adjacent sides of the reflector unit, thus defining two adjacent, different size pentagonal reflective surfaces on opposite sides of said ridge line and two trapezoidal reflective surfaces at opposite ends of said ridge line and between said pairs of peak lines, said reflector units arranged in groups of three with two adjacent sides of each of said three reflector units contiguous with an adjacent side of each of the other two of said three reflector units, thus defining a hexagonally shaped array of said three reflector units, and other said reflector units similarly arranged in regularly repeating, hexagonally shaped arrays adjacent said array of said three reflector units.

2. A reflector as in claim 1, wherein the different size pentagonal reflective surfaces and the trapezoidal reflective surfaces are contiguous with like reflective surfaces on adjacent reflector units, thus defining three different shaped major reflective areas on said reflector.

3. A reflector as in claim 1, wherein the pentagonal reflective surfaces are larger than the trapezoidal reflective surfaces, and said trapezoidal reflective surfaces are equal in size to one another.

4. A reflector as in claim 1, wherein the pentagonal reflective surfaces are disposed at an angle of about seventy degrees relative to one another.

5. A reflector as in claim 1, wherein one of the peak lines at each end of the ridge line extends outwardly at an angle of about thirty degrees relative to the ridge line.

6. A reflector as in claim 5, wherein the other of said peak lines at each end of the ridge line extends at an angle of about sixty degrees relative to the ridge line.

7. A reflector as in claim 2, wherein each of said reflector units in each hexagonal array forms with two adjacent reflector units of adjacent hexagonal arrays a further hexagonal array of three reflector units.

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