Sept. 14, 1965 P. E. NELSON 3,206,744

SEMAPHORE LIGHT

Filed June 11, 1963 2 Sheets-Sheet 1

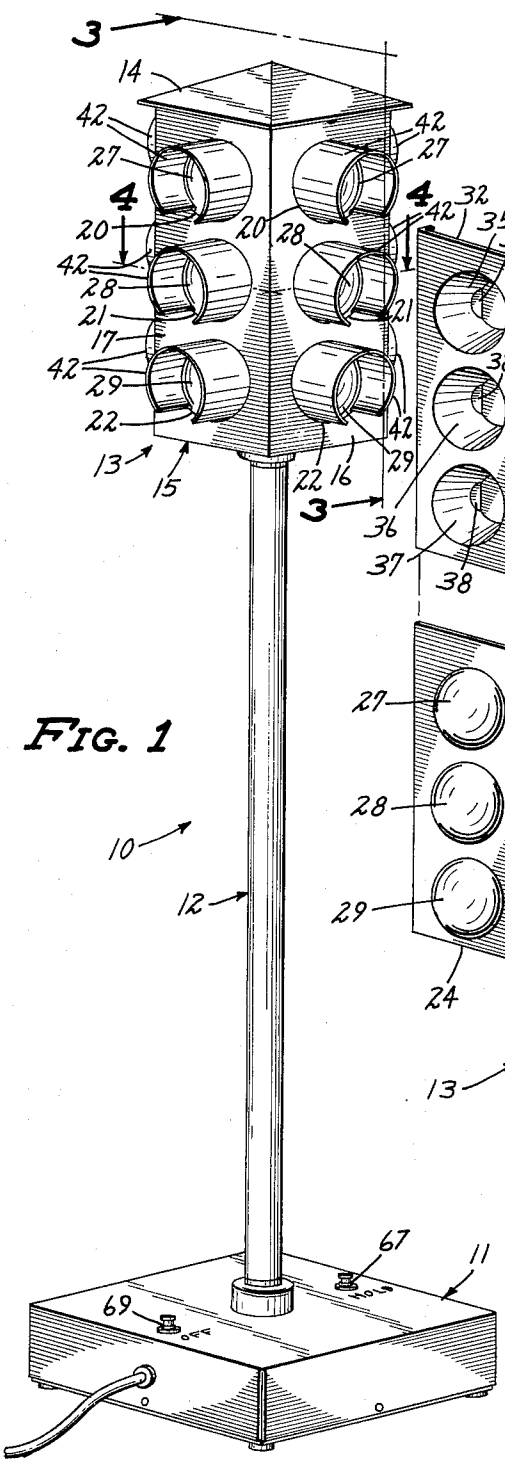

FIG. 1

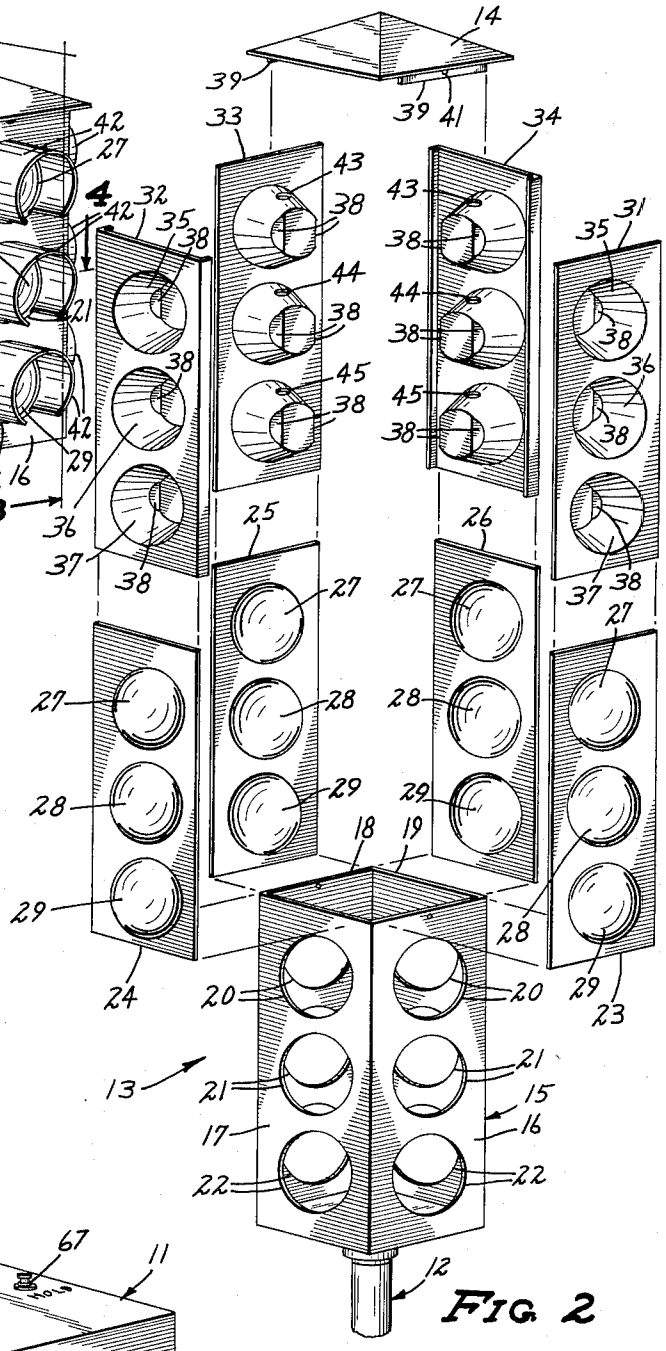

FIG. 2

INVENTOR.
PAUL E. NELSON
BY
Merchant, Merchant & Gould
ATTORNEYS

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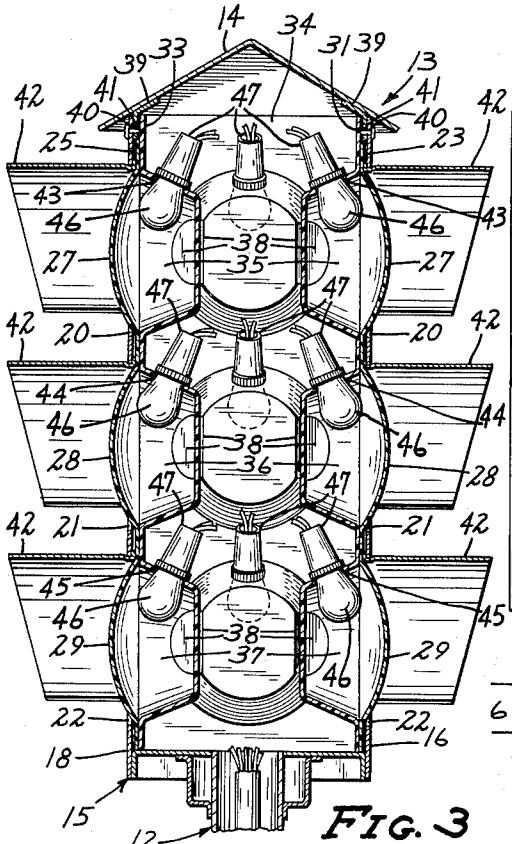

FIG. 3

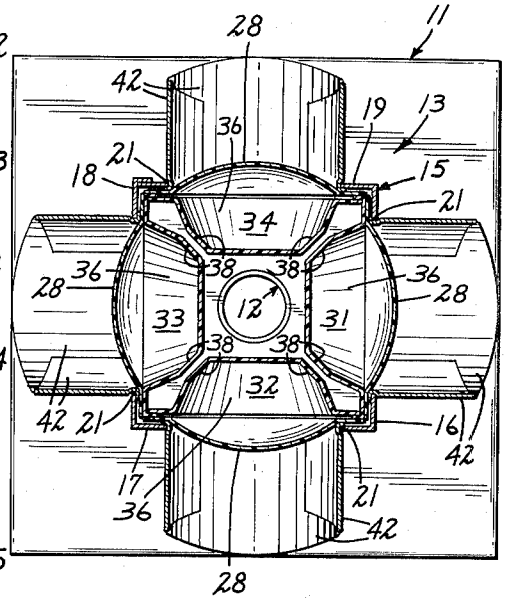

FIG. 4

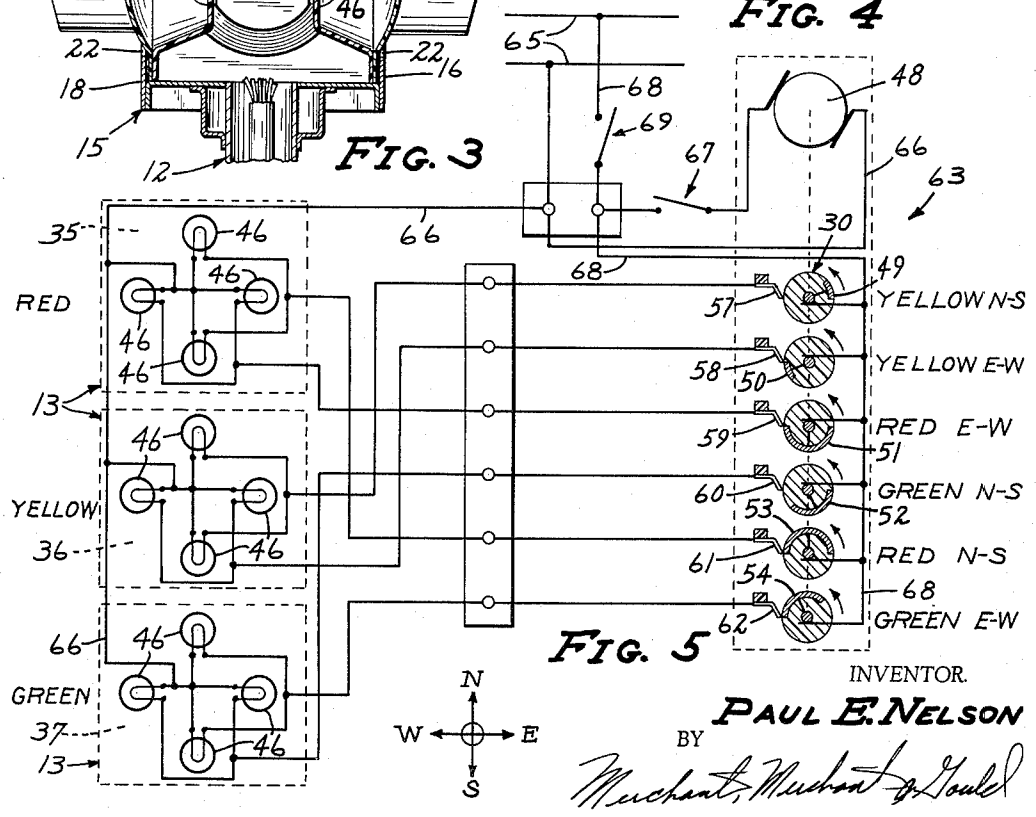

FIG. 5

INVENTOR.
PAUL E. NELSON
BY
Merchant, Merchant & Gould
ATTORNEYS

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SEMAPHORE LIGHT

Paul E. Nelson, Rochester, Minn.
(405 Kiowa Place, Boulder, Colo.)

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7 Claims. (Cl. 340—378)

This invention relates to a new and very useful construction for a semaphore light.

The education of small children in our complex society today must include training in traffic rules and regulations. There has been a long-felt need in the art for a simple semaphore construction which can be used in classrooms for demonstrating and educating youngsters in the elementary but vital safety procedures they must observe at intersections, etc.

Accordingly, it is an object of this invention to provide a reliable, simply made semaphore device adapted for use in classrooms in teaching young children traffic safety procedures.

It is another object of this invention to provide a semaphore construction which employs light transmissive and opaque plastic shapes which can be readily and conveniently fabricated by modern molding techniques, especially vacuum molding.

It is a still further object of this invention to provide an apparatus which is easily maintained, rugged and well designed for use as an educational tool.

It is another object of this invention to provide a semaphore construction which is suitable for use inside buildings at corridor intersections and the like, for regulating and controlling traffic flow.

Other and further objects of this invention will become apparent to those skilled in the art from a reading of the following specification, taken together with the drawings wherein:

FIG. 1 is a perspective view of a semaphore light constructed in accordance with the teachings of this invention;

FIG. 2 is an exploded view in perspective of the top portion of the embodiment shown in FIG. 1;

FIG. 3 is a vertical sectional view taken along the line 3—3 of FIG. 1;

FIG. 4 is a horizontal sectional view taken along the line 4—4 of FIG. 1; and

FIG. 5 is a schematic diagram of a circuit suitable for use in the embodiment shown in FIG. 1.

Turning to the drawings, there is seen in FIG. 1 a semaphore construction of the invention, herein designated in its entirety by the numeral **10**. The semaphore **10** employs a pedestal or base **11** upon which is vertically mounted a supported column **12**. On the upper end of column **12** is vertically positioned the semaphore lighting system which is herein designated in its entirety by the numeral **13**.

This system **13** is seen to consist of a housing **15**. The housing **15** has a plurality of vertical sides, though the embodiment shown employs four sides designated, respectively, as **16**, **17**, **18** and **19**. Each side **16**, **17**, **18** and **19** defines a plurality of vertically aligned apertures. Thus, in the embodiment shown, each side **16**, **17**, **18** and **19** has three apertures; an upper aperture designated in each case by the numeral **20**, a middle aperture designated in each case by the numeral **21**, and a bottom aperture designated in each case by the numeral **22**.

Four light transmissive lens panels, each designated by the respective numeral **23**, **24**, **25** and **26**, are provided. These panels, **23**, **24**, **25** and **26** are each constructed of a self-supporting light transmissive material, preferably of a plastic material, such as Celluloid. Each lens panel **23**, **24**, **25** and **26** is adapted to align with and fit against the inside face of a different one of each of the sides, respectively, **16**, **17**, **18** and **19**. Each of the lens panels

23, **24**, **25** and **26** in the region where it aligns with individual ones of the apertures **20**, **21** and **22** in each associated respective side **16**, **17**, **18** and **19** is provided with a raised area so that, relative to the exterior of the housing **15**, the individual lens panels **23**, **24**, **25** and **26** are generally concavely protruded through the individual apertures **20**, **21** and **22**. Thus, when viewed from their front side, each of the lens panels **23**, **24**, **25** and **26** has three convex protrusions designated in each case by the respective numerals **27**, **28** and **29**. The lens panels **23**, **24**, **25** and **26** with their respective convex protrusions **27**, **28** and **29** can be conveniently made by vacuum molding procedures well known to those of ordinary skill associated with the art of plastic fabrication. Situated behind each lens panel **23**, **24**, **25** and **26** is an opaque reflector panel which, in the embodiment shown, are each numbered, respectively, as **31**, **32**, **33** and **34**. Each reflector panel **31**, **32**, **33** and **34** is adapted to align with and fit against the inside face of a different one of each of the lens panels; in the embodiment shown, these are, respectively, the panels **23**, **24**, **25** and **26**. Each of the reflector panels **31**, **32**, **33** and **34** define, in combination with the adjacent lens panel convex protrusions **27**, **28** and **29**, an enclosed cavity designated in each case, respectively, by the numbers **35**, **36** and **37**. Each of the reflector panels thus defines the side walls and base of each cavity **35**, **36** and **37**.

Because, in the embodiment shown, the depth of each of the respective cavities **35**, **36** and **37** is such that the cavities would normally not fit in the interior of the housing **15**, the lateral side edges of each base portion in each cavity **35**, **36** and **37** are flattened at a 45° angle relative to the front face of each reflector panel **31**, **32**, **33** and **34**. In all cases, this flattened 45° face is designated by the numeral **38**. Thus, when the reflector panels **31**, **32**, **33** and **34** are all mounted in back of their respective lens panels **23**, **24**, **25** and **26** in housing **15**, the flat faces **38** permit the reflectors **31**, **32**, **33** and **34** to be contained in the housing **15** without forcing or otherwise distorting the cavities **35**, **36** and **37** in each panel **31**, **32**, **33** and **34**, respectively.

The bottom of housing **15** is closed and serves as a base on which the housing **15** can be mounted so that the semaphore **13** can have a vertical position in space. The top of the housing **15** is capped by a removable roof or cap element **14**. This roof **14** is equipped with a pair of downwardly extending flanges **39** which are so positioned on opposite sides of roof **14** as to permit the roof **14** to fit on the top of the housing **15** with the flanges **39** positioned adjacent the inside face of opposite side walls **16** and **18**, respectively. Then, through a pair of holes **40**, one adjacent to top edge of each side wall **16** and **18**, respectively, a pair of machine screws or the like are extended into appropriately formed threaded holes **41** in the flanges **39**. It is through the top of the housing **15** that the lens panels **23**, **24**, **25** and **26** and the reflector panels **31**, **32**, **33** and **34** are inserted in assembling the semaphore **13**.

In order to provide realism in the semaphore system **13**, each of the apertures **20**, **21** and **22** in each side **16**, **17**, **18** and **19** is provided in the assembled semaphore system **13** as shown in FIG. 1, with a hood **42** which circumferentially extends outward from the associated side walls **16**, **17**, **18** and **19**, respectively, around the upper side edges of the apertures **20**, **21** and **22**. The hoods **42** are conveniently attached to the housing **15** by any conventional means such as welding or the like.

In the uppermost portion of each cavity **35**, **36** and **37** in each panel **31**, **32**, **33** and **24**, respectively, is a small hole numbered, respectively, **43**, **44** and **45**. These holes **43**, **44** and **45** are adapted to receive an assembly comprising a small electric light bulb **46** and an attached

socket 47. The bulb 46 slips through each hole 43, 44 and 45, respectively, and screws into the base of the socket 47. Each of the bulbs 46 is connected by wires into an electric circuit, which will be described below.

Each of the panels 23, 24, 25 and 26 in its respective lens region 27, 28 and 29 is colored red, yellow and green, respectively, so as to reproduce the colors used in traffic signal controls. The coloration can be achieved by any conventional coating procedure, such as silk screening, spray painting, brushing, or the like, so long as the coating of paint applied does not reduce the light transmissive properties of each lens region 27, 28 and 29 to the point of opacity. Thus, each transparent lens panel 23, 24, 25 and 26 can be painted by solutions of organic dyes in an organic solvent. For example, a band of red dye can be placed across the uppermost portion of each panel 23, 24, 25 and 26 as shown by the dotted line portions on panel 23. Then, across the middle is deposited a band of yellow dye and across the bottom, a band of green dye.

Although any conventional electrical system can be employed, the system used is generally one which sequentially lights individual ones of the bulbs 46 so as to communicate signal information through individual ones of apertures in the housing 15 of the assembled semaphore system 13. Thus, the embodiment shown in the figures employs an electro-mechanical system which employs a repeat cycle timer 63. The timer 63 is a conventional and generally commercially available combination of a motor 48 with a rotor 30 having a plurality of axially spaced circumferentially extending contact timing strips 49, 50, 51, 52, 53 and 54. The rotor 30 is shown as being journalled on a shaft 55 for common rotation therewith. As the timing strips 49–54 revolve in response to rotation of motor shaft 55, the strips 49–54 come into contact with individual ones of brushes 57, 58, 59, 60, 61 and 62. As each contact is effected, a circuit is completed. Thus, the repeat cycle timer 63 having the motor 48, the strips 49–54, the brushes 57–62 is a multi-contact timer and can be conveniently mounted in the base 11 of semaphore 10 as shown in FIG. 1. It may be here noted that a cam operated timer device such as the Bristol Repeat Cycle Timer, series RCT–100 may be utilized to accomplish the same objective as the above-described type of timing device. The interconnection of the bulbs 46 with the timer 63 is shown more particularly by the schematic wiring diagram of FIG. 5. As shown in this diagram, the four bulbs 46 are mounted in each cavity 35 behind each convex lens protrusion 27, 28 and 29, respectively, and are electrically connected together in alternate pairs. Similarly, each of the bulbs 46 in cavity 36 behind each of the convex lens protrusions 28 is connected to each other in alternate pairs and finally, each of the bulbs 46 in the cavity 37 located behind each of the convex lens protrusions 29 is connected together in alternate pairs. Each alternate pair of bulbs 46 is connected in parallel within its respective circuit. The cavities 35, 36 and 37 are indicated collectively in the diagrammatic view of FIG. 3 by the dotted line outlines.

For convenience, each face will be referred to by the directions north, south, east and west as labeled in FIG. 5. The arrangement is such that one filament terminal of each bulb is connected to a hot side of the supply lines 65 by means of a hot lead 66. A branch of the hot lead 66 leads directly to the motor 48. In the diagram shown, the hot lead 66 can be considered as the negative line. The positive line 68 connecting with the source wires 65 is connected to both the drive motor 48 and to the shaft 55 of the rotor 30. The shaft in turn is connected to each of the strips. The branch of the positive line 68 leading to the motor 48 is equipped with a switch 67. Similarly, the main portion of line 68 before branching is equipped with a switch 69. Thus, when switch 69 is closed, power is supplied to each of

the bulbs 46, to each of the brushes 57–62 and to the motor 48 through a switch 67. Switch 67, an on-off switch for motor 48, enables one to "freeze" or hold the signal light lighting sequence at any given position, as for instructional purposes in a classroom, etc. Circuits between individual ones of the bulbs 46 and each of the brushes 57–62 are completed by appropriate wires so that when the strips 49–54 on the rotor 30 are rotated to complete contact with the brushes 57–62, the appropriate circuit is selectively closed so as to light selected alternate pairs of the bulbs 4. The lighting sequence in the diagram shown in FIG. 5 is such that the yellow east and west lights have just gone out and the red north and south lights have just lit. Similarly, the red east and west lights have just gone out and the green east and west lights have just gone on. The yellow north and south lights are not lit. It will be appreciated that the green lights are on for a shorter interval of time than the red light, owing to the fact that the yellow lights are allowed to light for a few seconds of time after the green lights expire and before the red lights come on in each of the directions north, south, east and west, respectively.

My invention has been thoroughly tested and found to be completely satisfactory for the accomplishment of the above objects; and while I have shown and described a preferred embodiment, I wish it to be specifically understood that the same is capable of modification without departure from the spirit and scope of the appended claims.

What I claim is:

1. A semaphore light comprising:
(a) a housing having an open end and also having one side of a generally elongated rectangular shape,
(b) said side further defining a plurality of vertically aligned apertures,
(c) means defining a plurality of light transmissive lenses, one for each of said apertures,
(d) each of said lenses being adapted to transmit different signal information,
(e) an elongated opaque panel disposed and arranged for insertion in and removable from said housing through said open end thereof and also adapted to align with and fit adjacent the inside face of said side,
(f) said opaque panel defining a plurality of cavities each rearwardly spaced from and adjacent a different one of said lenses,
(g) an electric light bulb mounted in each of said cavities, and
(h) electric means associated with each of said bulbs for sequentially lighting individual ones of said bulbs so as to communicate signal information through the individual ones of said apertures.

2. A semaphore light comprising:
(a) a housing having an open end and also having one side of a generally elongated rectangular shape,
(b) said side further defining a plurality of vertically aligned apertures,
(c) a light-transmissive panel adapted to align with and fit against the inside face of said side,
(d) said light transmissive panel further defining a plurality of generally convex lens portions, each such portion being adapted to align with a different one of said apertures, each such lens panel being adapted to transmit different signal information when illuminated rearwardly,
(e) an elongated opaque panel disposed and arranged for insertion in and removal from said housing through said open end thereof and also adapted to align with and fit against the inside face of said lens panel,
(f) said opaque panel defining a plurality of cavities each rearwardly spaced from the adjacent light transmissive panel, each such cavity being positioned opposite a different one of said apertures,

(g) an electric light bulb mounted in each of said cavities, and

(h) electric means associated with each of said bulbs for sequentially lighting individual ones of said bulbs so as to communicate signal information through the individual ones of said apertures.

3. A semaphore light comprising:

(a) a four-sided housing having an open end portion, said sides being generally vertically positioned and each having the general shape of an elongated rectangle,

(b) one side further defining a plurality of vertically aligned apertures,

(c) an elongated light transmissive lens panel adapted to align with and fit against the inside face of said side having said aperture,

(d) said lens panel further bearing different signal information in each region where such lens panel aligns with individual ones of said apertures in said side,

(e) an elongated opaque reflector panel adapted to align with and fit against inside face of said lens panel,

(f) said reflector panel defining, in combination with adjacent lens panel, an enclosed cavity in each region where such lens panel aligns with individual ones of said apertures in said side,

(g) said reflector panel and said lens panel being of a size and shape to be insertable in and removable from said housing through said open end portion thereof,

(h) an electric light bulb mounted in each of said cavities, and

(i) electric means associated with each of said bulbs for sequentially lighting individual ones of said bulbs so as to communicate signal information through individual ones of said apertures.

4. The structure of claim 3 in which the open end portion of said housing is at the top thereof, and said structure being in further combination with a cap member for closing the open top of said housing.

5. A semaphore light comprising:

(a) a pedestal,

(b) a column vertically mounted on said pedestal,

(c) an elongated four-sided housing mounted on said column and having an open end portion, said sides being generally vertically positioned and each having the general shape of an elongated rectangle,

(d) each side further defining a plurality of vertically aligned apertures,

(e) four light transmissive elongated lens panels of self-supporting material, each such lens panel being adapted to align with and fit against the inside face of a different one of each of said sides,

(f) each of said lens panels further bearing different signal information in each region where such lens panel aligns with individual ones of said apertures in each associated respective sides,

(g) four elongated opaque reflector panels, each such reflector panel being adapted to align with and fit against the inside face of a different one of each of said lens panels,

(h) each of said reflector panels defining, in combination with the adjacent lens panel, an enclosed cavity in each region where such lens panel aligns with individual ones of said apertures in each associated side,

(i) said reflector panels and said lens panels being of a size and shape to be insertable in and removable from said housing through said open end portion thereof,

(j) an electric bulb mounted in each of said cavities whose socket region generally extends through the wall of said reflector panel in each cavity region, and

(k) electric means associated with each of said bulb for sequentially lighting individual ones of said bulbs so as to communicate signal information through individual ones of said apertures.

6. The semaphore light of claim 5 wherein each of said sides defines three vertically aligned apertures.

7. The semaphore light of claim 5 wherein the signal information on each lens panel is in the form of the colorations red, yellow and green, respectively, whereby a different color may be visually observed at each aperture in each respective side.

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NEIL C. READ, *Primary Examiner.*