United States Patent

[11] 3,585,585

[72] Inventor **Frank A. Grosz**
2310 Joliet St., New Orleans, La. 70118

[21] Appl. No. **827,205**
[22] Filed **May 23, 1969**
[45] Patented **June 15, 1971**

[54] **LIGHT TRANSMITTING SIGNAL STRIP ON ROAD**
7 Claims, 6 Drawing Figs.

[52] **U.S. Cl.** **340/114,** 340/114, 340/117, 340/321
[51] **Int. Cl.** **G08b 5/00**
[50] **Field of Search** 340/380, 117, 114, 321

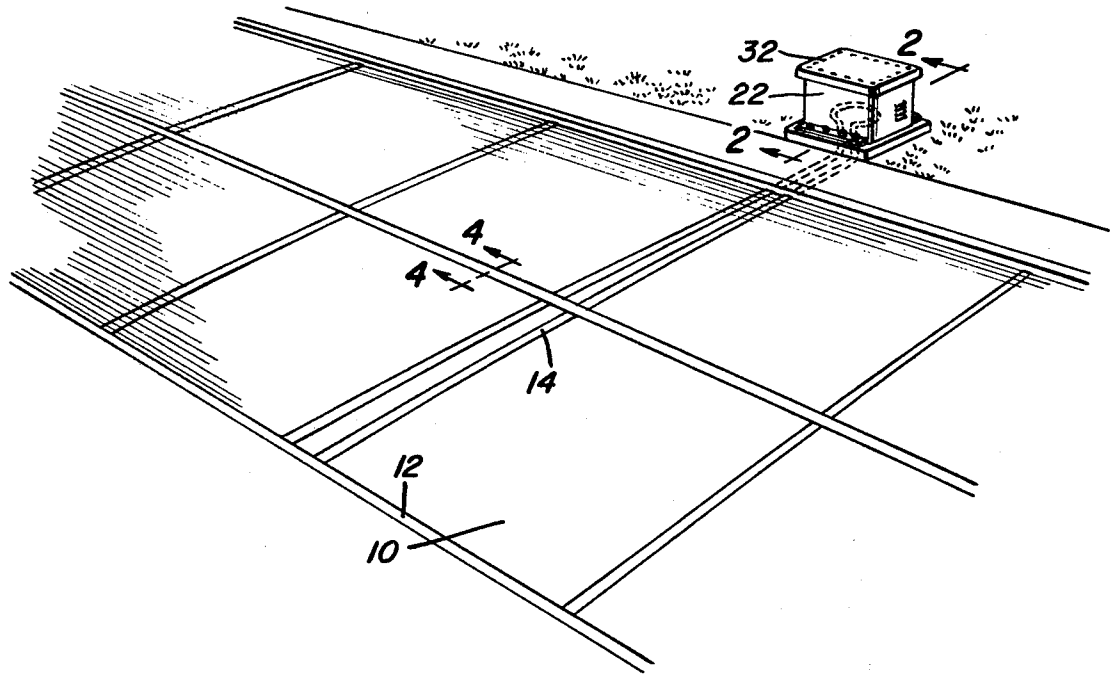
[56] **References Cited**

UNITED STATES PATENTS

2,486,998	11/1949	Szeklinski	340/321
2,692,921	10/1954	Goff	340/380 X
2,848,597	8/1958	Knotterus	340/117 X
3,153,773	10/1964	Wood	340/380 X
3,273,115	9/1966	Lafon	340/117

Primary Examiner—Harold I. Pitts
Attorneys—Clarence A. O'Brien and Harvey B. Jacobson

ABSTRACT: A light transmitting plastic strip or ribbon employed in a system for guiding and/or signalling highway vehicular traffic, people walking in caves, people working in mines and people engaged in various activities where it is desirable to signal them or guide from a remote location. The light transmitting plastic is illuminated by the use of white and/or colored lights in a continuous or intermittent manner so that a desired signal or other information may be transmitted along the plastic strip or ribbon.



PATENTED JUN 15 1971 3,585,585

SHEET 1 OF 2

Fig . 1

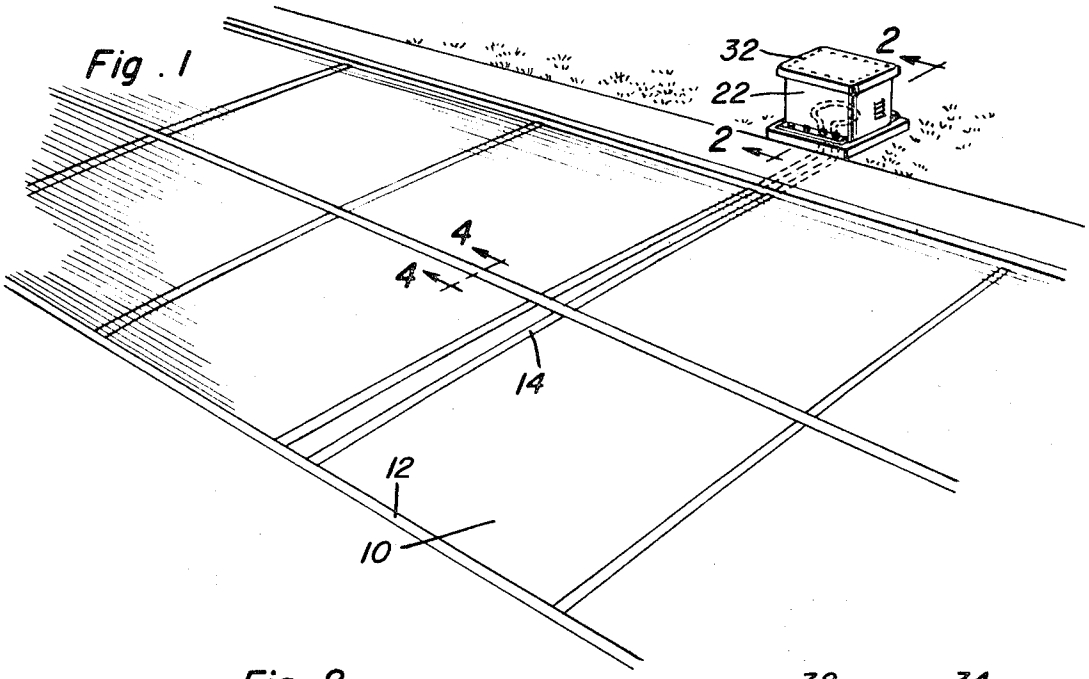
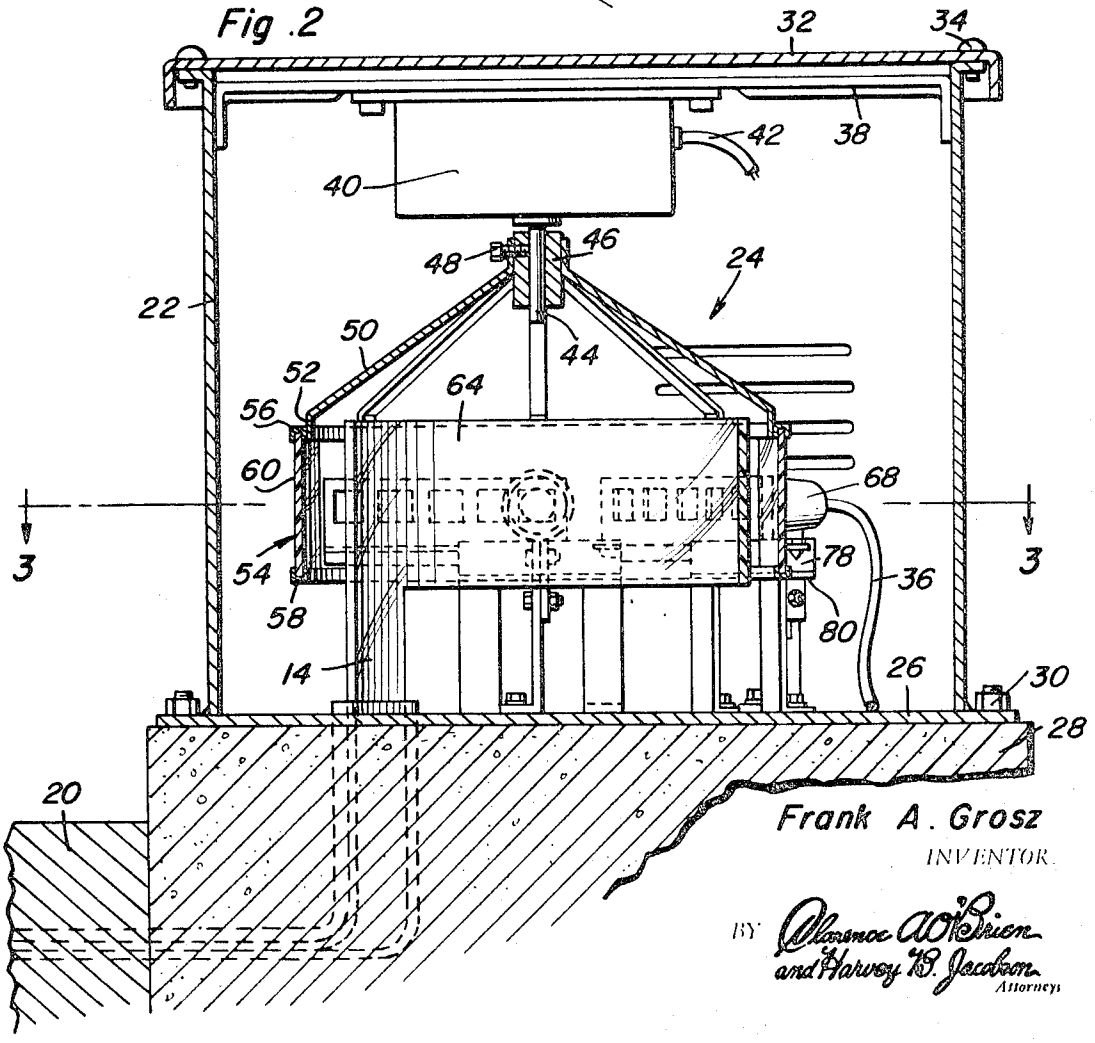


Fig .2



Frank A. Grosz
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

Fig. 3

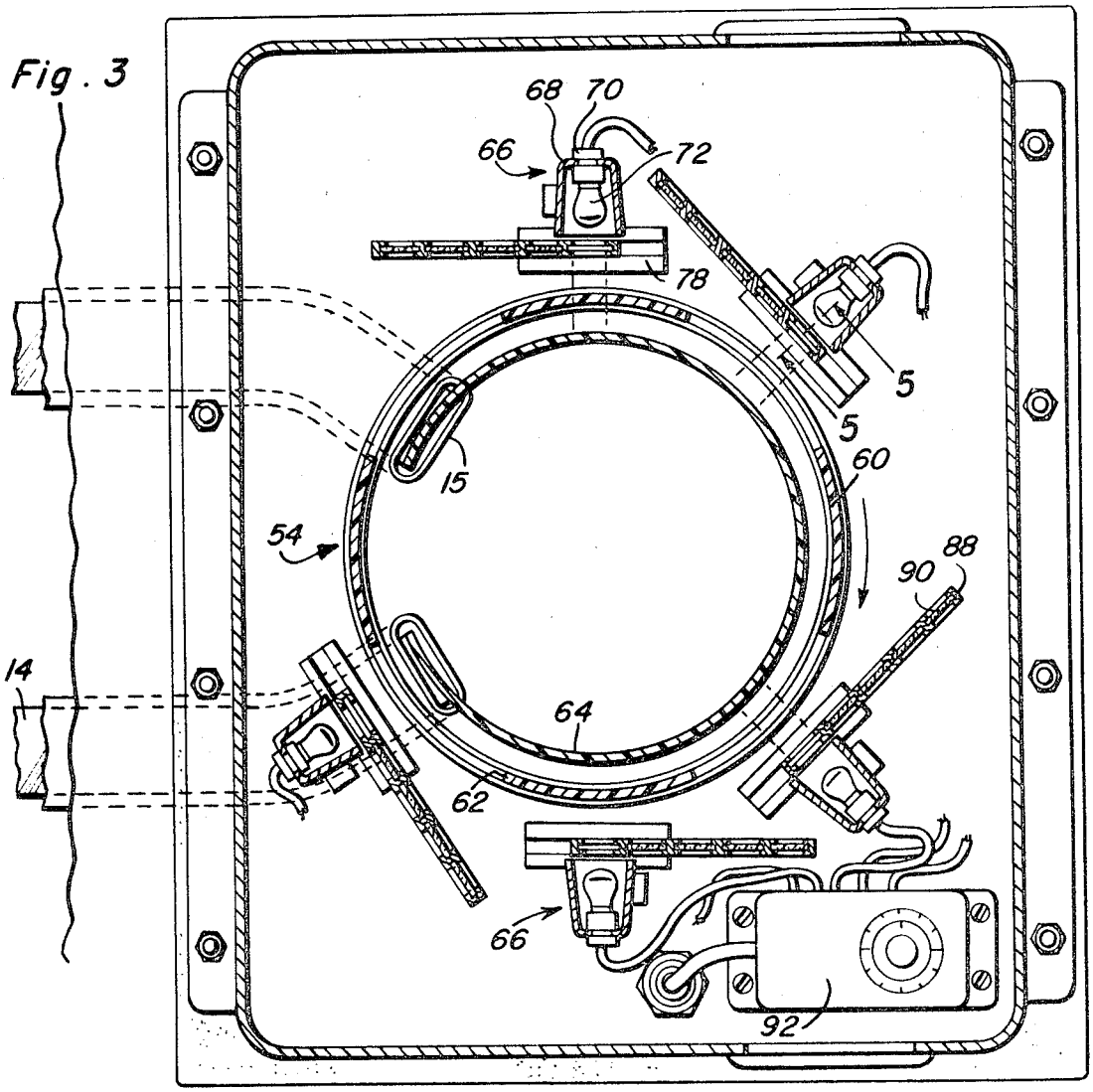


Fig. 4



Fig. 5

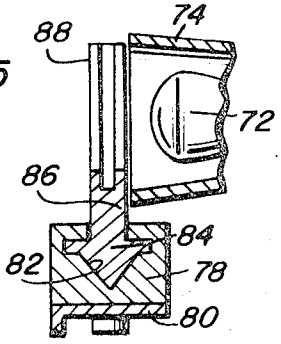
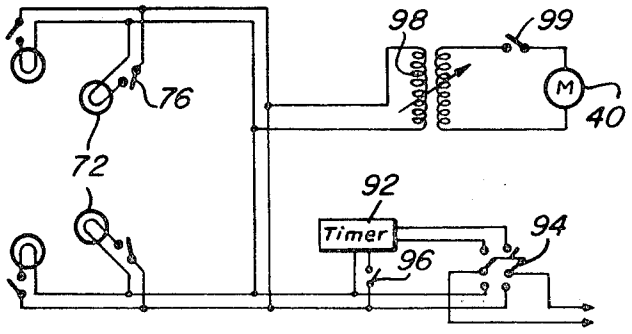


Fig. 6



Frank A. Grosz
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

LIGHT TRANSMITTING SIGNAL STRIP ON ROAD

The present invention generally relates to a system for guiding and/or signalling people by employing a light transmitting plastic strip or ribbon oriented along highways, in caves, mines or any other areas where people may require guiding and/or signalling from a remote position.

An object of the invention is to provide a light transmitting plastic strip or ribbon illuminated by a continuous or intermittent white or colored light or any combination thereof to enable the strip or ribbon to be employed as a guide or signal device for persons observing the strip or ribbon at locations remote from the location of the source of illumination for the strip or ribbon.

Another object of the present invention is to provide a strip or ribbon in accordance with the preceding objects which may be employed in association with highways to guide or signal operators or vehicles, in caves to guide or signal people walking therein, in mines for guiding or signalling people working therein or in other areas or locations occupied by people in which it may be necessary as a routine matter or during an emergency to guide or signal such persons from a remote location with the construction of the strip or ribbon being such that it will retain its continuity and light transmitting characteristics for extended periods of time and under various adverse conditions.

A further object of the present invention is to provide a light transmitting plastic strip or ribbon which is quite simple in construction, easy to install in various locations and relatively inexpensive in installation and maintenance.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a perspective view of a section of a roadway illustrating the light transmitting strip or ribbon associated therewith and with the source of illumination of the strip or ribbon illustrated alongside of the roadway.

FIG. 2 is a vertical sectional view of the illumination source for the light transmitting strip or ribbon taken along section line 2–2 of FIG. 1.

FIG. 3 is a transverse, plan sectional view taken substantially upon a plane passing along section line 3–3 of FIG. 2 illustrating the structure of the source of illumination including the structure for providing various colored lights and controlling operation of the device.

FIG. 4 is a detailed sectional view of the roadway and plastic strip mounted thereon.

FIG. 5 is a detailed sectional view taken substantially upon a plane passing along section line 5–5 of FIG. 3 illustrating the light source and guide structure for varying the light characteristics of the source of illumination.

FIG. 6 is a schematic view illustrating the controls for the source of illumination.

Referring now specifically to the drawings, the use of the invention associated with a roadway is specifically disclosed with it being understood that other uses described hereinafter incorporate the basic principles of the guiding or signalling system. The roadway designated by numeral 10 may be of any suitable and conventional construction and will include longitudinal strips of ribbons 12 and transverse strips or ribbons 14 of plastic material mounted on the upper surface thereof as illustrated in FIG. 4 with the strips 14 being secured to the roadway surface by any suitable bonding material 16 with the edges of the plastic strip 14 projecting above the roadway surface 10 with the edges being designated by the numeral 18. Two of the plastic strips 14 extend laterally of the roadway 10 through under or over a curbing 20 if one is provided into the interior of a housing or enclosure 22 for association with a source of illumination generally designated by the numeral 24.

The housing 22 includes a bottom plate 26 supported on a supporting base of concrete or the like 28 and secured thereto by any suitable fastening means 30. The housing is also provided with a removable cover 32 secured in place by fasteners 34 to enable access to the interior of the housing 22 and to the source of illumination 24 which is connected to a source of electrical energy through a conductor 36 to provide electrical energy to the source of illumination 24.

Supported within the interior of the housing 22 by a suitable bracket structure 38 is a drive motor 40 such as an electric motor connected with a source of electrical energy through conductor 42 and provided with a depending output shaft 44. A collar or sleeve 46 is mounted on the output shaft 44 and is secured thereto by a suitable lock bolt or setscrew 48. Attached to the collar 46 and extending downwardly and outwardly therefrom in diverging relation to form a skeleton of an inverted cone is a plurality of supporting straps or members 50 which have their lower and outer ends terminating in vertical depending ends 52 which support a rotatable cylindrical curtain generally designated by numeral 54 and which includes an upper channel 56 and a lower channel 58 which face each other and which have a plurality of circumferentially spaced members 60 received therebetween with the spaces between the members 60 being open as indicated by numeral 62 thus providing a rotatable cylinder having certain areas thereof open and certain areas thereof covered by the curtain members 60.

Disposed interiorly of and concentric with the interrupter curtain 54 is a cylindrical plastic strip or ribbon 64 which is continuous with and joined to the two adjacent lateral or transverse strips 14 which extend into the housing 22 and upwardly through the base plate 26 with the two strips 14 connected with the spaced ends of the cylindrical plastic strip or ribbon 64 as illustrated in FIG. 3 with the plastic strip or ribbon 64 spaced inwardly of and concentrically of the interrupter curtain 54.

Positioned radially outwardly of the interrupter curtain 54 at circumferentially spaced points is a plurality of light assemblies generally designated by the numeral 66 with each light assembly including a mounting bracket 68, a bulb socket 70 and a light bulb 72. The bracket 68 includes an outwardly tapering shield or reflector 74 for the light bulb 72 for directing the light rays radially toward the interrupter curtain 54. Each light assembly 66 also includes a switch 76 so that any of the lights may be rendered operative or inoperative.

Positioned in front of each lamp 72 is a multiple lens holder that includes a longitudinally elongated slide or track 78 supported by a suitable bracket 80 and including a longitudinal undercut groove 82 therein having a V-shaped bottom surface for slidably receiving a correspondingly shaped base 84 of an elongated lens holder 86 that includes a plurality of upstanding members 88 supporting different colored lenses 90 with the members 88 having inwardly facing grooves receiving the edges of the lenses 90. One of the lens receiving areas is left blank to enable while light to pass therethrough with the other lenses being colored a desired color to impart a color to the light transmitted through the interrupter curtain to the light transmitting plastic 64.

The device is controlled by a timer 92 associated with the source of electrical energy through the double-throw switch 94 so that the timer may be used or may be bypassed depending upon the individual installation involved. The timer 92 is connected with the electric power source with a switch 96 to preclude its operation when the double-throw switch 94 is in the position supplying electrical energy directly to the motor 40 and the lamps 72. The motor 40 is also provided with a speed control device 98 by which the speed of the motor may be adjusted for synchronization of the motor speeds in several illuminating stations or sources. If no rotation is desired and the motor is to be inoperative, then switch 99 can be opened.

The cross strips 14 may be located on the roadway one to two miles apart and the roadway may be provided with three longitudinal plastic strips 12 with the cross strips being joined

with the longitudinal strips in the same plane and in abutting engagement to provide H-junctions with the junctions thereof being preferably cemented together. This provides a crisscross network of plastic strip so that even in the event one of the plastic strips may become interrupted during normal use, the plastic strips still will be interconnected due to the gridwork arrangement. Where the plastic strips extend through curbing or the like, they are encased in a protective sleeve or tube **15** and the two adjacent cross strips **14** at each illumination station will terminate in the cylindrical or U-shaped connector **64** thus providing parallel feeders for transmitting illumination to the various longitudinal and transverse strips or ribbons.

If only white light is desired, all of the lens holders are adjusted so that the open area therein will be aligned with the lamp so that only white light will impinge upon the plastic strip **64** and if the interrupter curtain motor **40** is operative, the white light will be intermittent due to sequential occlusion of the white light by the segmental curtain element **60**. If a particular color of light is desired, the lens holder is correspondingly adjusted to bring the appropriately colored lens into registry with the light bulb so that light transmitted through the lens holder will impinge upon the plastic strip **64** as colored light. Inasmuch as the illumination stations will be spaced at predetermined intervals along the roadway, a speed control adjustment is provided for the interrupter motor so that all of the illumination stations or sources will be synchronized. Any suitable speed control may be used such as a variable transformer or the like to adjust the output speed of the interrupter motors for synchronization of movement of the curtains each of the illumination stations.

This system will provide a guiding or signalling strip of light either white or colored and either continuous or intermittent along highways, roadways and the like and may be used for warning and cautioning motorists or signalling and guiding motorists to take certain actions or precautions depending upon circumstances or conditions. For example, a brilliant red illuminated strip could mean that a danger exists because of an accident, hazardous conditions or the like while a brilliant amber could mean the driver should proceed with caution while a green strip could mean that driving within the posted speed limit is safe. Another color light such as blue could be employed to indicate that all motorists should pull off to the side of the highway and stop or provide a passage for emergency vehicles or the like. The particular color arrangement provided and the signals imparted thereby may vary but it is desirable to retain the usual meaning for such lights as they presently exist in traffic control systems. The illumination source may be controlled at a remote location or may be controlled from a preset timer such as during periods of darkness or the like. For example, a person in radio or telephone communication with policemen, toll booth operators and the like on a toll highway or other persons normally patrolling highways could immediately actuate the device upon receiving information regarding hazardous conditions on a particular highway or a particular area of the highway. The significance of various signals may be standardized throughout the highway system and such information disseminated to the public by usual communications, printed material or the like.

Another use for the present invention is in underground areas such as caves or mines. Many tourists or visitors enter caves and travel on relatively narrow and poorly lighted paths which frequently cause injury and hazardous conditions inasmuch as the walking surfaces are sometimes damp and slippery.

By providing two strips of ribbons of light, such as a green ribbon and a red ribbon, tourists or visitors could be guided along the path of safe footing and direction with the red ribbons of illuminated light indicating a danger spot or an area to use extreme caution or avoid it. Both ribbons of light could be made to glow steadily or intermittently to further accentuate their utility by attracting attention thereto.

Similarly, workmen laboring in mines could be guided and cautioned by such green and red ribbons of light. Mines frequently have accumulations of coal gas or the like and a red illuminated strip could caution workers against entering or working in that particular area. The ribbon would function safely because it is a cold illumination with no heat involved and is not produced electrically at the underground location and thus produces no sparks whatsoever. The plastic light transmitting ribbons or strips could be oriented in various arrangements and positioned over, around or through obstructions and is constructed of noncorrosive material having resistance to any chemical action of the minerals, such as coal, metal ores or the like and would remain serviceable even at relatively high temperatures. For example, the plastic strips could be employed in salt mines without problems inasmuch as the strips would be resistant to corrosive action of the salt which deteriorates presently employed electrical lighting systems. A white lighted ribbon could be employed in various areas as a guiding line and a blue lighted ribbon could be used for sending messages to or from entrapped miners or the like so that information could be sent to the miners or the miners could send information relating to their location, condition, and the like. This of course, would require that the miners have a source of illumination such as a light so that the light transmitting plastic strip could be illuminated from an underground position and observed by persons above ground or the like. Such a device could be a battery operated lamp with a slotted space or holder in front of it to receive a colored lens where color is desired and a hand-operated shutter could be provided to produce intermittent illumination by which Morse code could be transmitted.

In the case of entrapped miners, the multiple lens holder would be of substantial benefit in definitely pinpointing the exact location where miners may be entrapped. By having various lenses arranged in a particular sequence at different locations under ground, the entrapped miners could actuate the illuminating device and gradually push the lens holder in front of the light beam and persons at ground level could see the different colors and their sequence and thus determine the location of the particular illumination means by virtue of the particular sequence being previously oriented in a particular position in the mine. For example, a chart in the mine office would indicate the position of the source of illumination having that particular sequence of colors and thus enable the precise location of the miners to be determined. Once the location of the miners is known, the rescue operation may be more effectively undertaken and temporary measures may be provided for providing the miners with food, water and the like. Also, the persons at ground level could return the same color sequence back to the entrapped miners in the same manner so that the entrapped miners would know that help is on the way and that rescuers know where they are. By employing a blinker or shutter arrangement, Morse code could be transmitted to enable specific messages to be transmitted to and from entrapped miners. Various procedures may be worked out for transmitting messages either by using a predetermined color sequence code or by employing a standard code such as the Morse code.

To insure the maximum use of the plastic strips between the ground level station and any and all lamps throughout the entire mine, the ribbons or strips of plastic may be interconnected in the form of a network so that even though one or more strips may be broken in the event of a cave-in or the like the remaining plastic ribbon network system would still be usable.

The light transmitting plastic strips of ribbons may be permanently illuminated, temporarily illuminated or intermittently illuminated. By having multiple illumination stations located at reasonable distances apart, the light energy output of one station would boost the light energy output of adjacent stations thus providing substantially a constant illumination factor throughout the length of the strips. The strips would be all the same color from station to station if the same condition extended over a long distance. By employing the various colors transmitted as constant or intermittent illumination, an

effective guiding and/or signalling system is provided for various uses including the uses specifically described herein and other uses as may become obvious.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation show n and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What I claim as new is as follows:

1. In combination with a roadway, an assembly for guiding or signalling people from a remote location comprising a light transmitting plastic strip having a first portion on the roadway and a second portion remote from the roadway and means adjacent said second portion and remote from the roadway for illuminating the plastic strip with the light being transmitted along the plastic strip to be observed by people at any point along said second portion.

2. The structure as defined in claim 1 wherein said means for illuminating the plastic strip includes means for intermittently illuminating the strip to provide an intermittent guide or signal to the people observing the strip, said means for intermittently illuminating the plastic strip including a light bulb directed toward the plastic strip, and a movable curtain having sequential areas thereof opaque and transparent for movement between the light and plastic strip for intermittently illuminating the strip.

3. The structure as defined in claim 2 wherein said movable curtain is cylindrical.

4. The structure as defined in claim 3 wherein said plastic strip includes an arcuate portion disposed interiorly of the curtain in substantially concentric relation thereto.

5. The structure as defined in claim 4 together with an elongated lens holder disposed between the light bulb and curtain, means supporting the holder for longitudinal adjustment in relation to the light bulb, and a plurality of transparent colored lenses in said holder to produce various colored lights on the plastic strip.

6. The structure as defined in claim 5 together with motor means for moving said movable curtain with respect to said light bulb.

7. The structure as defined in claim 6 wherein said means supporting the holder includes an elongated slot, and said lens holder includes an extended portion slidably engaged in said elongated slot to produce various colored lights on the plastic strip.

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,585,585 Dated June 15, 1971

Inventor(s) Frank A. Grosz

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Claim 1, line 8, change "second" to --first--.

Signed and sealed this 4th day of January 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Acting Commissioner of Patents

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334