July 21, 1964 A. J. JACKSON, JR 3,142,038

HIGHWAY SIGN

Filed Oct. 29, 1962

FIG. 1

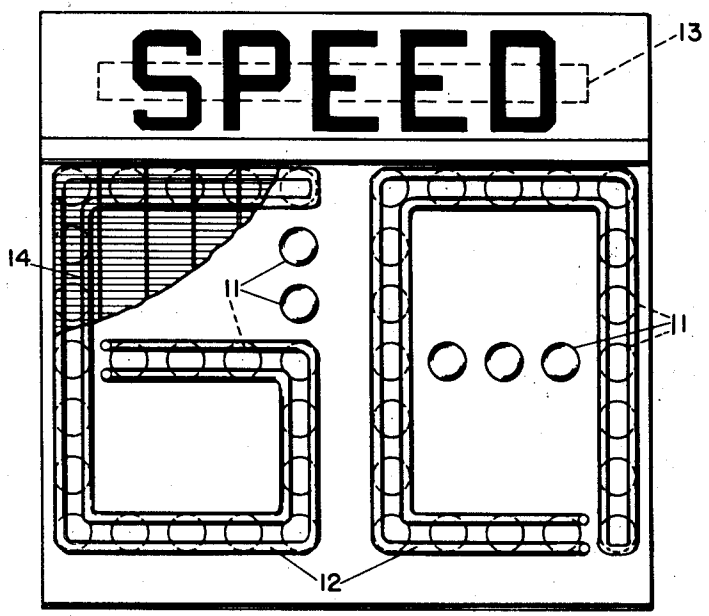


FIG. 2

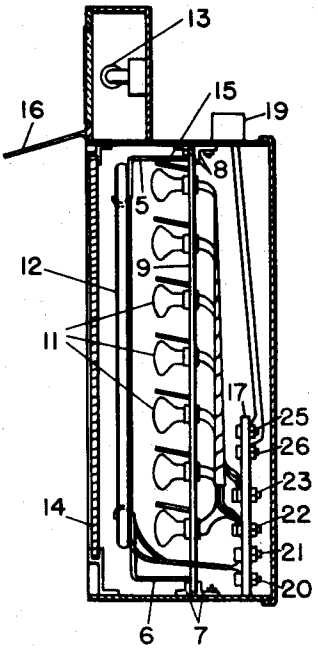
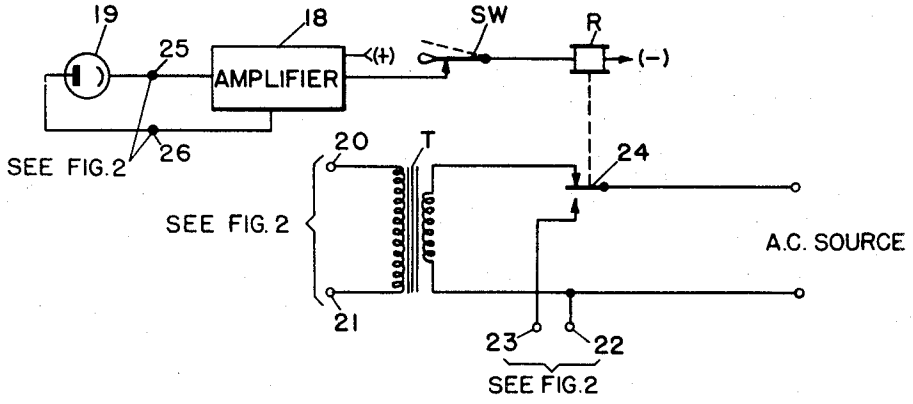


FIG. 3



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HIGHWAY SIGN

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This invention relates to an electrically illuminated highway sign and more particularly relates to a traffic sign for highways which can be controlled to display variable speed limits dependent upon road and weather conditions.

One requirement for the efficient use of present-day highway systems is the ability to permit the movement of vehicular traffic at some optimum safe speed in accordance with the existing road and weather conditions. The current practice of utilizing highway signs employing a fixed speed limit is unsatisfactory in that the speed established is a compromise between a safe and efficient speed under good weather and road conditions and a reduced speed permissible during inclement weather or under hazardous road conditions.

Therefore, the present invention proposes to provide an electrically illuminated highway sign in which an array of easily discernible, fog-penetrating incandescent lamps are utilized which can be controlled to selectively display a plurality of safe driving speeds required during inclement weather and/or hazardous road conditions. Neon type lamps having transparent or translucent tubing are superimposed over the array of incandescent lamps.

The neon lamps have dual tubing which is formed to outline the higher speed effective under normal safe driving conditions. The individual tubing utilized to outline a specified character is space mounted a distance sufficient to allow the fog penetrating incandescent lamps which are centrally located behind the neon tubing to transmit light through the spaced area between the individual neon tubes. Although dual tubing is employed for the neon lamps, the transmitted light strikes the retina of the eye of the oncoming motorist as a unitary character. Light transmitted from the perimeters of the incandescent lamps is transmitted through the transparent or translucent glass used to form the neon tubing.

The aforementioned lamp configuration is mounted within a suitable housing in which the side facing the oncoming vehicle operator consists of louvered screening for intercepting the solar rays before reaching the lamps. The louvers are spaced apart and tilted downwardly at an angle which eliminates solar reflections from the lamps yet permits the vehicle operator who is looking up at the sign to easily see the displayed speed limit.

Accordingly, it is one object of this invention to provide a novel electrical sign which may be controlled to display a plurality of safe driving speeds in accordance with road and weather conditions.

Another object of this invention is to provide a highway sign of the character described in which the display is readily discernible during bright sunlight.

A further object of the present invention is to provide a highly economical highway sign in which a variety of integers may be displayed over a compact area.

Other objects of this invention will be apparent from the following description and the claims with reference to the accompanying drawings in which:

FIG. 1 is a front elevation of a sign illustrating one embodiment of the present invention;

FIG. 2 is the side view of the embodiment shown in FIG. 1;

FIG. 3 is a simplified control circuit for illuminating the current embodiment of this invention.

Referring to FIG. 1 of the drawings, an array of similar incandescent lamps **11** is shown. The lamps **11** are

preferably yellow fog penetrating seal beam lamps. The array illustrated is utilized in the interest of efficiency when a limited number of driving speeds are to be displayed. Specifically, the numerals 3 through 9 and zero could be formed using the array shown. Ordinarily, this would be a sufficient presentation. However, if a complete presentation of all the digits from zero to 9 were desired, a complete matrix of lamps would be utilized.

A neon type lamp **12** manufactured in doubly arranged transparent or translucent glass tubing is superimposed over the seal beam incandescent lamps. The clear glass neon tubing is formed to outline the numerals of the speed limit established under normal driving conditions, e.g. 60 miles per hour. The pattern for the numerals is determined by arranging the neon tubing to establish the interior and exterior perimeters of the desired numeral.

When yellow fog penetrating seal beam lamps are used, one effective characteristic color for the neon lamps is green. This color is obtainable by ionizing Argon gas and coating the inner surface of the tubing with green fluorescent powder, a product commercially available.

When road or weather conditions dictate a lower, safer speed, the fog penetrating seal beam lamps **11** are selectively energized. The majority of the light rays from the incandescent lamps are transmitted through the spaced opening between the individual legs of the dual neon tubing **12**. The light from the fringe areas of the incandescent lamps **11** is transmitted through the transparent or translucent tubing of the neon lamps. Consequently, an effective, easily discernible, unitary character presentation is transmitted and the newly selected driving speed can readily be seen by the passing motorist.

As the seal beam lamps **11** consume more power, the normal safe driving speed would generally be indicated by the neon lamp configuration **12** which has a longer life expectancy. However, if a given set of conditions dictate the reversal of this procedure, the sign would be equally as effective.

The upper part of the housing contains a permanent sign consisting of the word "Speed." A preferred arrangement would be black lettering with a white luminescent background. A fluorescent lamp **13** is suitably enclosed in the housing in order to provide a sufficient contrast between background and lettering to insure that the lettering is easily discernible during the hours of darkness.

In order to provide a most effective indication during the daylight, a louvered screen, generally indicated at **14** is provided. Preferably the screen is of the type which is tremed "Koolshade" and manufactured by the Reflectal Corp., located at 200 South Michigan Avenue, Chicago 4, Illinois, and described in their Bulletin KS–E8–7 printed October 1958. The screening **14** consists of horizontal louvers approximately $\frac{1}{20}$" wide and $\frac{1}{200}$" thick which are located permanently in place by vertical warp wires spaced $\frac{1}{2}$" apart. The louvered screening **14** prevents the sunlight from being reflected from the surface of the seal beam lamps **11** and the neon tubing **12**. However, the lamps and the neon tubing, when illuminated, can readily be seen by a passing motorist because the louvers are tilted downwardly and he is looking upwardly. The louvers also provide protection for the lamps **11** and the neon tubing **12** during inclement weather conditions.

Interior louvers **15** (FIG. 2) are provided as ducts to insure that any moisture penetrating the interior of the housing does not fall onto the seal beam lamps **11**. This is particularly important when it is considered that such lamps are inclined to develop a so-called "hot spot" on their glass in the area adjacent to the end of the filament and they might easily be broken due to the temperature difference between the glass comprising the

"hot spot" and the moisture. The louvers **15** may be eliminated and a commercially available waterproof plastic coating for the lamps **11** may be utilized. An external visor **16** is also provided to further protect the incandescent lamps and the neon tubing from the solar rays and inclement weather. Electrical connection is made to the neon lamps **12** and the incandescent lamps **11** by means of the terminal board **17**.

The incandescent lamps **11** are mounted on a baseboard **9** which is secured to the interior of the housing by pairs of angle brackets **7** and **8**. The brackets supporting the underside of the baseboard **9** are removable and the lamp and neon tubing mounting structure is unitarily removable for maintenance purposes. Brackets **5** and **6** secure the neon tubing **12** to the baseboard **9**. A light sensing means **19** electrically connected to the terminal board **17** is mounted on the upper structure of the housing.

FIG. 3 illustrates a simplified control circuit for operating the highway sign. A suitable source of alternating current is used to selectively energize either the neon type lamps **12** or the seal beam lamp array **11** in accordance with the position of contact **24** of the relay R. A light-sensing means **19**, such as a photoelectric cell, is externally mounted on the highway sign. During the hours of clear daylight, the amplified output of the photoelectric cell **19** is employed to retain the relay R energized over an obvious circuit including the normally closed switch contact SW. Under these circumstances, the A.C. source is circuited across the primary winding of the transformer T. A high voltage is developed in the secondary of the transformer T which is electrically connected by means of terminal board connectors **20** and **21** to the neon type lamps **12** to indicate the normal driving speed. During the evenings, or when fog or other conditions restrict visibility, the output of amplifier **18** is insufficient to hold the relay R energized and the closure of back contact **24** applies the output of the A.C. source across the terminals **22** and **23** of the terminal board **17**. Under these conditions, the seal beam array **11** is energized and rendered effective to display a selected safer speed in view of the more restrictive driving conditions.

A manual switch SW, circuited between the relay R and the amplifier **18**, is provided to be opened for manual deenergization of the relay R whenever road hazards such as construction work, snow or oil might require a safer speed.

As the present invention is solely concerned with the structure of the sign per se and not with a specific control circuit, the simplified control circuit shown in FIG. 3 is sufficient to meet the requirements of practice. However, a number of control circuits capable of selectively actuating the seal beam lamp array to provide a plurality of numerical indications are available in the art. For example, see the Patent No. 2,623,111 issued to G. R. Chervenka et al. on December 23, 1952.

Having described one embodiment of the highway sign of the present invention, I desire it to be understood that various modifications, adaptations and alterations may be made to the specific form shown to meet the requirements of practice without in any manner departing from the spirit or scope of this invention.

What I claim is:

1. An electrical display comprising, a housing, a plurality of incandescent lamps mounted on said housing arranged to form a specified character, and a second illuminating means made from transparent material arranged to form the outline of a specified character superimposed over said array.

2. An electrical display comprising, a housing, a plurality of incandescent lamps mounted on said housing arranged to form a specified character and a neon lamp made with clear glass tubing superimposed over said incandescent lamps arranged to form the outline of a specified character by establishing the interior and exterior perimeter of said character, said neon tubing at times transmitting certain of the light waves emitted by said incandescent lamps.

3. An electrically illuminated highway sign comprising a housing open at one side, a louvered screening arranged to cover said open side, an array of sealed beam incandescent lamps mounted within said housing behind said louvered screening effective for at times displaying one of a plurality of distinctive characters, a neon lamp made with material which will transmit light rays interposed between said array of incandescent lamps and said louvered screening effective when energized to display a second character, and a control means for alternately energizing said array and said neon lamp in accordance with road and weather conditions.

4. An electrical display comprising, a housing, a neon lamp having doubly arranged transparent tubing mounted on said housing to form the outline of a specified character, said tubes of said neon lamp being substantially parallel and space mounted with respect to each other, and a plurality of incandescent lamps arranged to form a specified character mounted to the rear of said neon lamp centrally located in the spacing between the tubing of said neon lamp, the light waves emanating from the perimetric edges of said incandescent lamp being transmitted by said transparent neon tubing when said incandescent lamps are energized and said neon lamp is deenergized.

5. An electrically illuminated highway sign comprising, a housing open on one side, a louvered screening arranged to cover said open side, a neon lamp mounted behind said screen made with clear glass tubing doubly arranged and spaced to form the interior and exterior perimeters of a specified character, and a plurality of incandescent lamps arranged to form a specified character mounted on said housing at the rear of said neon lamp centrally located in the spacing between the tubing of said neon lamp for at times transmitting light waves through said spacing and said clear glass neon tubing.

6. An invention as claimed in claim 5 wherein a plurality of drainage ducts are mounted above said incandescent lamps to prevent moisture from falling upon them.

7. The invention as claimed in claim 5 wherein a screen slanting downwardly is mounted above the open side of said housing to prevent solar rays from reflecting from the surface of said lamps.

8. An electrically illuminated highway sign comprising, a housing open on one side, a louvered screening arranged to cover said open side, a mounting board removably connected to said housing in a plane substantially parallel to said open side, a plurality of incandescent lamps arranged on said mounting board to form a specified character, a clear glass neon lamp formed to outline a specified character affixed to said mounting board and spaced between said incandescent lamp and said louvered screening, and a light sensitive control means responsive to conditions of external visibility for at times energizing said incandescent lamps to transmit light waves through said clear glass neon tubing.

No references cited.