April 4, 1944. J. W. IVEY ET AL 2,345,979

SIGNALING SYSTEM

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Fig. 1.

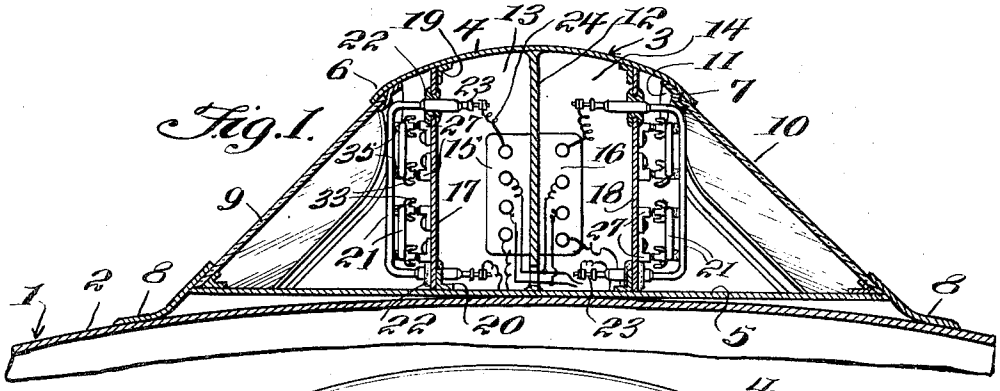


Fig. 2.

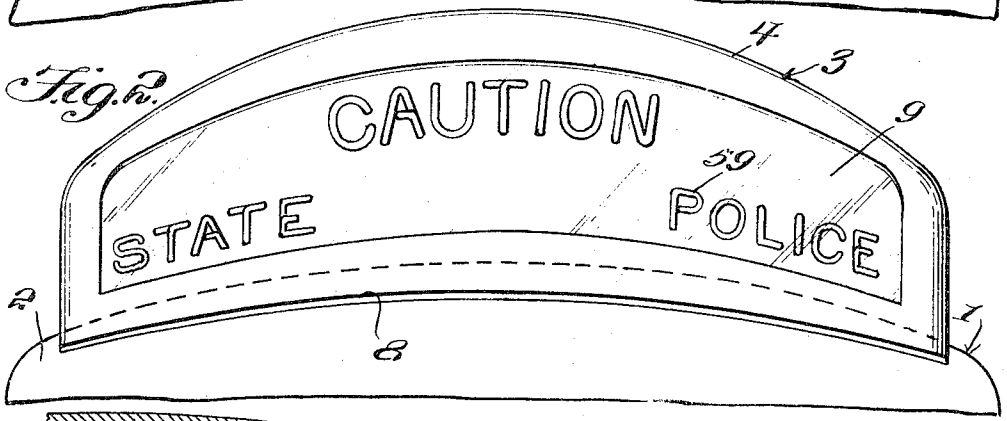


Fig. 3.

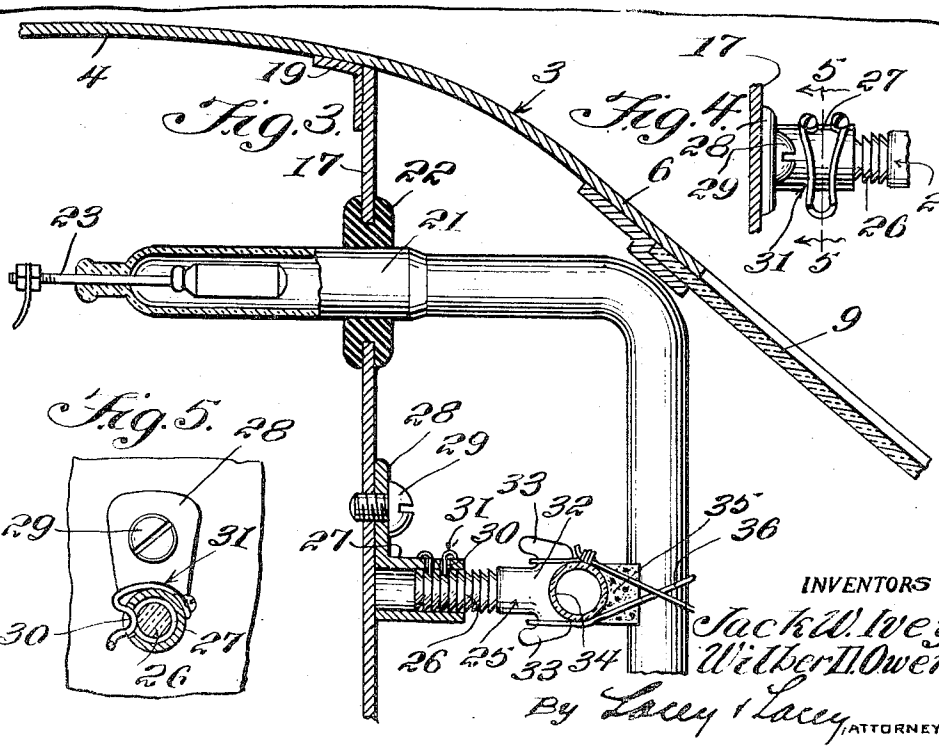


Fig. 4.

Fig. 5.

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Fig. 8.

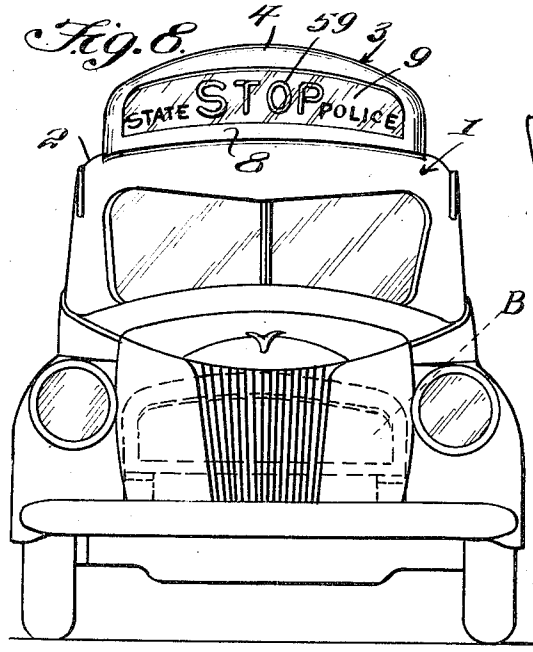


Fig. 10.

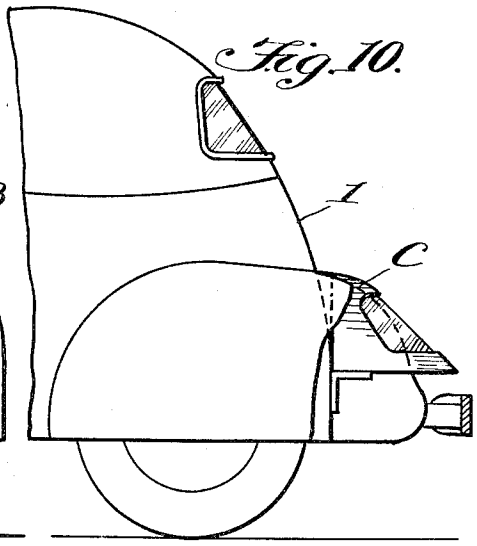


Fig. 9.

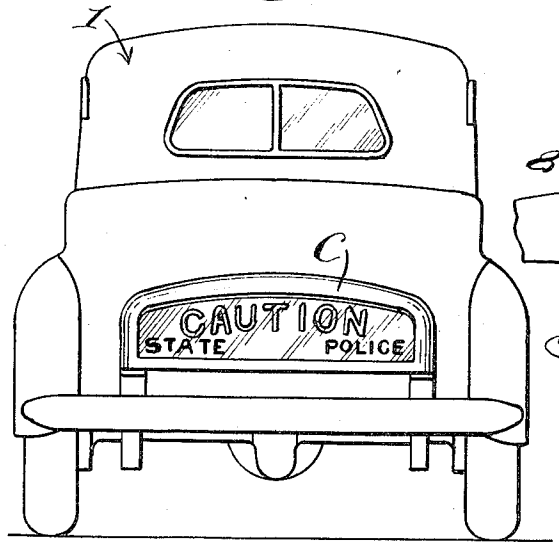


Fig. 7.

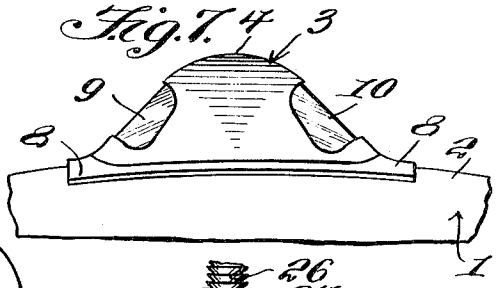
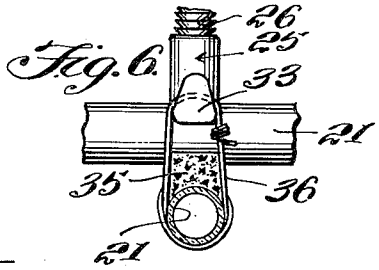


Fig. 6.



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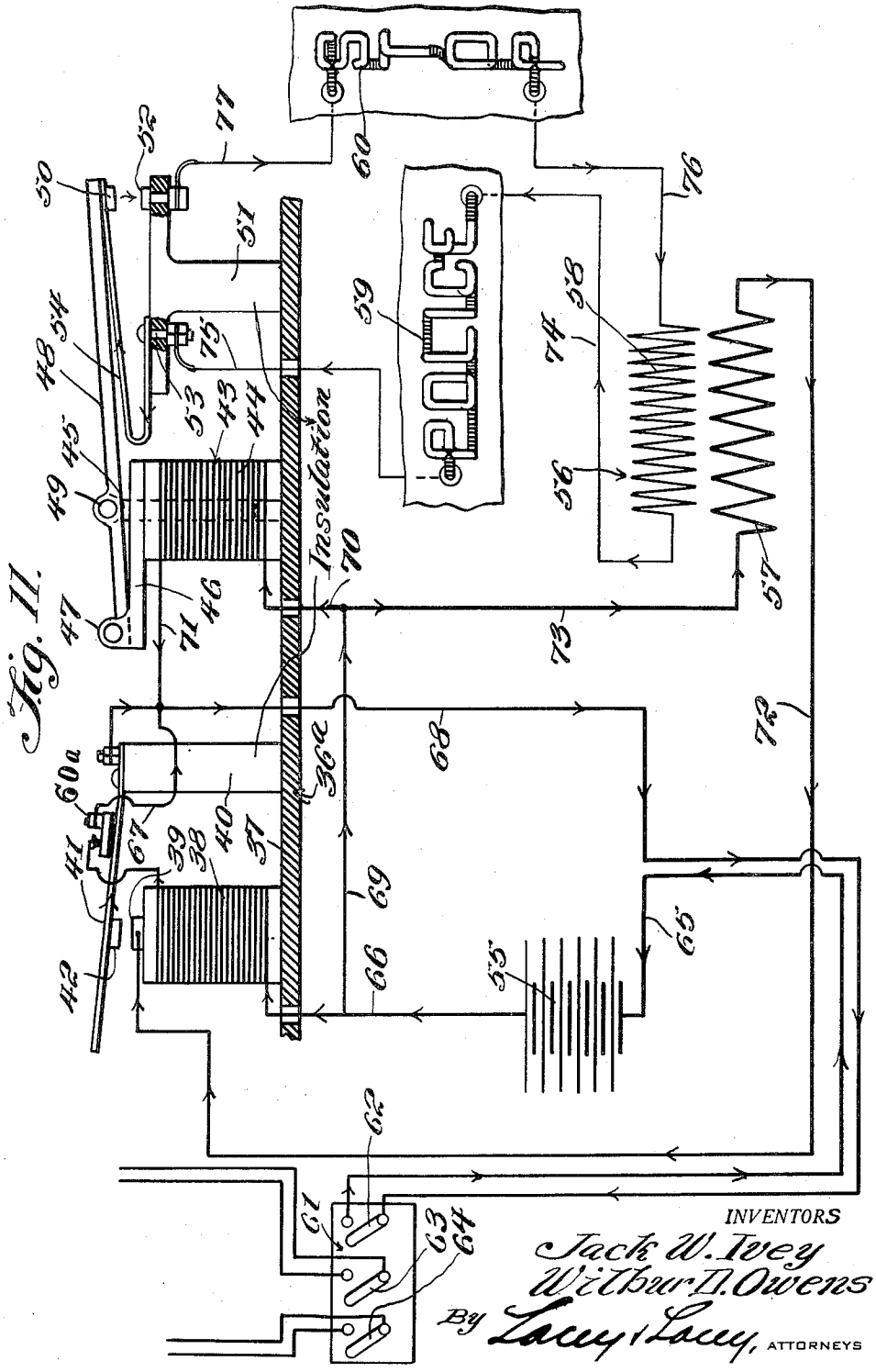


Fig. 11.

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UNITED STATES PATENT OFFICE

2,345,979

SIGNALING SYSTEM

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Application June 6, 1941, Serial No. 396,924

1 Claim. (Cl. 177—329)

This invention relates to signs and more particularly to an improved signaling system for use on automobiles, or other vehicles for controlling traffic.

One object of the invention is to provide a signaling system employing an improved signaling unit which is mounted so that it can be seen either from the front or the rear of the vehicle.

Another object of the invention is to provide a signaling system wherein the signaling unit employs a number of individually energizable signs which may be controlled from a remote point for displaying a number of different visible signals.

Another object of the invention is to provide a signaling system, the signaling unit of which is formed with streamlined walls for cutting down air resistance and, at the same time, protecting the signs from injury from the elements.

Still another object of the invention is to provide a system of this character wherein improved switching means is employed for controlling the individual signals.

A further object of the invention is to provide a signaling system which, in a modified embodiment, makes use of a plurality of signal housings mounted at the front and rear of a vehicle for simultaneously displaying signals.

And still another object of the invention is to provide a signaling system which is not limited to use with automobiles but which may be used for other purposes.

Still further objects of the invention, not specifically mentioned hereinbefore, will become apparent during the course of the following description.

In the drawings forming a part of our application:

Figure 1 is a vertical sectional view showing the construction of the signaling unit,

Figure 2 is a front elevation of the signaling unit as it would appear mounted in operative position,

Figure 3 is an enlarged detail vertical sectional view of the signaling unit and showing particularly the manner of mounting certain of the neon tubes employed,

Figure 4 is a detail side elevation particularly showing the clip employed for retaining one of the neon tube mounting posts in position,

Figure 5 is a vertical sectional view on the line 5—5 of Figure 4,

Figure 6 is a vertical sectional view, partly in elevation, showing the manner of connecting certain of the neon tubes to each other,

Figure 7 is a side elevation, on a reduced scale, showing the signaling unit as it would appear in operative position,

Figure 8 is a front elevation showing the signaling unit mounted on a vehicle,

Figure 9 is a rear elevation showing a slightly modified embodiment of the invention,

Figure 10 is a side elevation of the modification shown in Figure 9, and

Figure 11 is a diagrammatic view showing the wiring diagram employed.

In the drawings forming a part of our application, like numerals of reference will be seen to designate similar parts throughout the views.

The signaling unit of our signaling system, as disclosed in Figures 1 through 8 of the drawings, is preferably mounted on the roof of a motor vehicle, said motor vehicle being designated generally at 1 and the roof thereof at 2. The signaling unit is indicated generally at 3 and is substantially inverted U shape in transverse section. As seen in Figure 2, the unit 3 is of a length sufficient to extend throughout the major portion of the width of the top 2 and is of arcuate shape longitudinally so that it will conform conveniently to the surface of the top 2.

It should be understood that, although our invention is particularly well suited for use in conjunction with motor vehicles, it may also be used effectively at fixed locations, such as buildings and the like.

The signaling unit 3 includes an arcuate top wall 4 and a bottom wall 5. The unit also includes front and rear walls 6 and 7 which have their corresponding lower ends turned outwardly, at 8, to engage the upper surface of the roof 2. The walls 6 and 7 are cut away throughout the major portions of their lengths and heights and said cut away portions are closed by transparent panes 9 and 10 which are of arcuate shape longitudinally and which are held in place by means of frames 11. Attention is particularly called to the fact that, inasmuch as the panes 9 and 10 and the walls 6 and 7 are inclined with respect to the roof 2 of the vehicle 1, a streamlined effect will be secured. This streamlined effect is further enhanced by the provision of the top wall 4 which is arcuate in both its lateral and longitudinal dimensions. The streamlined effect will, of course, cut down wind resistance and add to the appearance of the signaling unit.

Mounted within the unit 3 medially of its width and extending transversely throughout its length is a partition 12, said partition extending throughout the entire height of said signaling unit and

dividing the interior of said unit into compartments, one of said compartments being indicated at 13 and the other at 14. The partition 12, in addition to defining the compartments 13 and 14, also serves as a support for high tension transformers 15 and 16, one of which is mounted in each of the compartments 13 and 14. The high tension transformers are for the purpose of energizing the neon signs or signals to be described hereinafter.

Mounted in each of the compartments 13 and 14 are signal supporting walls 17 and 18. Inasmuch as the walls 17 and 18, and the signals mounted thereon, are identical in construction, a description of one will suffice for both. In this connection, however, it is desired to state that the signals mounted on the walls in the compartments 13 and 14 will be of a different nature. For example, in Figure 8, the front of the signaling unit is shown with the word "Stop" and the words "State Police" displayed. In Figure 2 of the drawings, the rear of the signaling unit is shown with the word "Caution" and the words "State Police." However, the mounting of the neon tubes necessary to display the signals will be identical so that, as stated, a description of one will suffice for all. The wall 17, as best seen in Figure 1, extends throughout the longitudinal height of the unit and is held in place by means of brackets 19 and 20. The wall 17 extends throughout the entire longitudinal length of the unit and is disposed substantially medially of the compartment 13.

Mounted on the outer face of the wall 17, for display through the transparent pane 9, are neon tubes 21. It should be understood that the construction of the tubes themselves forms no part of our invention and that said tubes are formed to spell out the desired words. The neon tubes, however, have their terminal portions extending through grommets 22 which are of insulating material and which are mounted in the wall 17. As best seen in Figure 1, the terminal portions of the tubes are each provided with terminals 23 which are electrically connected to the high tension secondary of the transformer 15 by means of conductors 24.

In order to assure that the neon tubes will be properly supported on the wall 17, for displaying signals through the pane 9, we provide supporting posts 25 which are formed of glass or other suitable insulating material and which have notched or threaded portions 26 which are received in the sleeve 27 of a mounting base 28, said mounting base being held in position on the wall 17 by a screw 29. The post 25 is held in place in the sleeve 27 by the engagement of circumferentially extending teeth or ribs of the post by end portions 30 of a clip 31 which surrounds the sleeve 27. The post 25 includes a head 32 which is formed with hooks 33 and an arcuate end surface 34 which arcuate end surface receives the arcuate surface of a portion of one of the neon tubes 21. Another of the neon tubes 21 crosses over the first-mentioned tube at this point and said second tube is cushioned from the first-mentioned one by means of a resilient block 35. A tie wire 36 extends about the second-mentioned tube, straddles the resilient block 35, extends about a portion of the first-mentioned tube and is tied beneath the hooks 33 for retaining the tubes against displacement such as would be caused by repeated jarring or other vibration. It should be understood that as many of the posts 25 as may be desired may be employed, one of the posts commonly being employed at each point where one of the tubes crosses over another.

As stated hereinbefore, a number of neon signs will be mounted on each of the walls 17 and 18, and these signs are individually controlled from a point within the vehicle or from some other remote point. Each of the signs will preferably employ its own high tension transformer and will be connected to said transformer by the conductors 24. The primaries of each of the high tension transformers are connected with switching mechanism to be described hereinafter for permitting the individual control hereinbefore mentioned.

In Figures 1 through 8 of the drawings, we have disclosed the signaling unit as it would appear mounted on the top of a vehicle. In Figures 8, 9 and 10, however, we show two separate signaling units, one of which may be mounted at the rear of the vehicle and the other at the front thereof. In Figure 8, there is shown in dotted lines at B an individual unit which may be placed in front of the vehicle and, at C in Figure 10, there is shown a unit to be mounted at the rear of the vehicle. The units B and C are preferably streamlined for cutting down wind resistance.

It is desired to emphasize that we do not limit ourselves to the specific arrangement shown as, if desired, a signaling unit or units may be mounted at any suitable point on a vehicle. Furthermore, said signaling units are not limited to use on motor vehicles but may be used in other locations, when desired.

The switching means we employ for controlling the individual signs will now be described. The switching means is shown generally at 36 in Figure 11. This switching means will be duplicated when necessary in any particular installation. In other words, separate switches will preferably be employed for remotely controlling selected signs. The switching means shown in Figure 11 is only typical, as it is obvious that the structure may be varied to suit particular installations. In Figure 11, the numeral 37 indicates a base on one end of which is mounted a magnet 38 having a pole piece 39. Also mounted on the base and in close spaced relation to the magnet 38 is a supporting post 40 on which is mounted one end of an armature 41 which armature is formed of spring metal. Mounted on the under surface of the armature 41 to cooperate with the pole piece 39 is a contact 42.

At its opposite end, the base carries a solenoid 43 which includes a magnet 44 and a plunger 45. Mounted on the upper end of the magnet and extending laterally therefrom is an armature mounting block 46 which has formed on its free end portion ears defining a mounting yoke 47. Swingingly connected with the solenoid 43 and having its inner end portion pivotally mounted between the yoke 47 is an armature 48, said armature being pivotally connected to the plunger 45 at a point near the inner end of the said armature by a pivot pin 49. Mounted on the under surface of the outer end portion of the armature 48 is a contact 50. Also mounted on the base is a contact supporting post 51 which is of substantially T shape. The contact post carries a contact 52 thereon which cooperates with the contact 50 for closing an electric circuit, in a manner to be set forth in more detail hereinafter. The post 51, like the post 40, is of insulating material and also carries a terminal 53. Connected between the terminal 53 and the armature 48 is a

bowed leaf spring 54, the purpose of which is to retain the armature 48 normally in inoperative position, with the contacts 50 and 52 separated. It should be understood that the solenoid 43, armature 48 and contact 50 thereon, contact posts 51 and contact 52 thereon and the spring 54 cooperate to define a high tension switch.

The switch assembly 36a is connectively connected in a circuit which includes a battery 55, a high tension transformer 56, which includes a primary 57 and a secondary 58, typical signs 59 and 60, and a remote control switch unit 61 which includes switches 62, 63, and 64. The switches 63 and 64 are connected to switch assemblies identical with the assembly 36a, or with other electrical mechanism to be controlled. The switch 61 has one terminal connected with one terminal of the battery 55 by a conductor 65. The other terminal of the battery is connected with one terminal of the magnet 38 by a conductor 66. The other terminal of the magnet is connected to the other terminal of the switch 62, through an interrupter 60a, by conductors 67 and 68, which conductor 68 is also connected to the armature 41. The battery is also connected to one terminal of the magnet 44 of the solenoid 43 by the conductors 66, 69 and 70. A conductor 71 connects the remaining terminal of the magnet 44 with the conductor 68 and thus to the switch 62.

The pole piece 39 of the magnet 38 is connected to one terminal of the primary 57 of the transformer 56 by a conductor 72. The other terminal of the primary 57 is connected with the battery through the conductors 66, 69 and 73. One terminal of the secondary 58 of the transformer 56 is connected to one terminal of the sign 59 by a conductor 74. The other terminal of the sign 59 is connected to the terminal 53, and thus to the armature 48 through the spring 54, by a conductor 75. The remaining terminal of the secondary 58 is connected with one terminal of the sign 60 by a conductor 76, the other terminal of said sign being connected to the contact 52 by a conductor 77.

In operation, when the switch 62 is closed, the magnets 38 and 44 are energized with the result that the armatures 41 and 48, respectively, will be attracted for engaging the contact 42 with the pole piece 39 and also engaging the contacts 50 and 52. Attention is directed to the fact that the solenoid 43 will be slightly faster in operation than the magnet 38 with the result that the contacts 50 and 52 will be closed before the contact 42 is engaged with the pole piece 39. The advantage for this construction is that arcing at the contacts 50 and 52 will be eliminated for the reason that, as stated, these contacts will be closed before the primary of the transformer 56 is energized, which energization takes place upon engagement of the contact 42 with the pole piece 39.

The magnets 44 and 38 may be wound to operate on either 6 or 110 volts, A. C. or D. C. to switch the high tension current from a remote position and without arcing. The system hereinbefore described is particularly adapted for use on ambulances, school and passenger buses and other vehicles, as well as on police cars.

It is desired particularly to call attention to the fact that the signaling units employed effectively protect the neon tube signs and their high tension power supplies from the elements so that danger of the system being accidentally rendered inoperative is reduced to a minimum. Also, the particular mounting structure for the neon tube signs assures that said signs will not be damaged by vibration or the like.

It is believed that it will now be understood that we have provided a signaling system which is both simple in construction and highly efficient in use. Further description is believed unnecessary.

Having thus described the invention, what is claimed as new is:

A signaling system for vehicles including a high voltage operated visual signal, a transformer having a primary and a high voltage secondary, a first relay having a coil and a pair of normally open contacts, a second relay having a coil, a pair of normally open contacts and a pair of normally closed contacts, a manually operated switch, a source of low tension direct current, a circuit including the coil of the first relay in parallel with a series circuit including the coil of the second relay and the normally closed contacts of said second relay, said parallel circuit being in series with said source of low tension current and said manually operated switch, a circuit including the primary of said transformer, the normally open contacts of said second relay and said source of low tension direct current, a circuit including the secondary of said transformer, the said visual signal and the contacts of said first relay, said relays being so constructed that the contacts of said first mentioned relay close before and open after the contacts of said second mentioned relay whereby arcing at said first mentioned contacts will be prevented.

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