United States Patent [19]

Justice

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[54] **HIGHWAY SIGN SYSTEM**

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[21] Appl. No.: **114,011**

[52] **U.S. Cl.**.....**340/330,** 340/334

[51] **Int. Cl.**.....**G09f 13/04**

[58] **Field of Search**.....340/334, 110, 324 R, 340/22, 31–33, 332, 286, 310, 225, 330; 40/132 D

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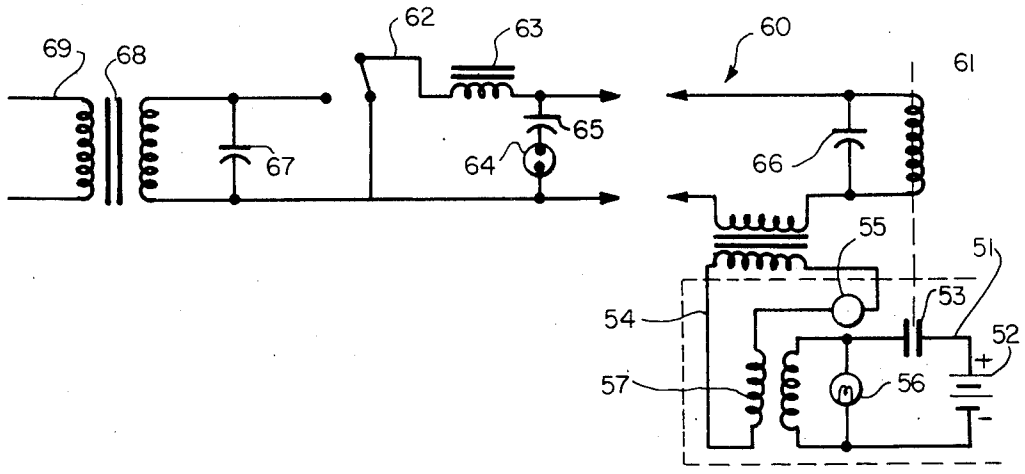
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Assistant Examiner—Marshall M. Curtis
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[57] **ABSTRACT**

A remotely controlled sign system for informing motorists of limited access highways of the facilities available at each exit. The system has a signboard with a plurality of individually lit panels, each advertising a different facility. Each panel is operated by a remotely controlled circuit which also informs the facility operator whether the panel is lit or unlit.

13 Claims, 8 Drawing Figures



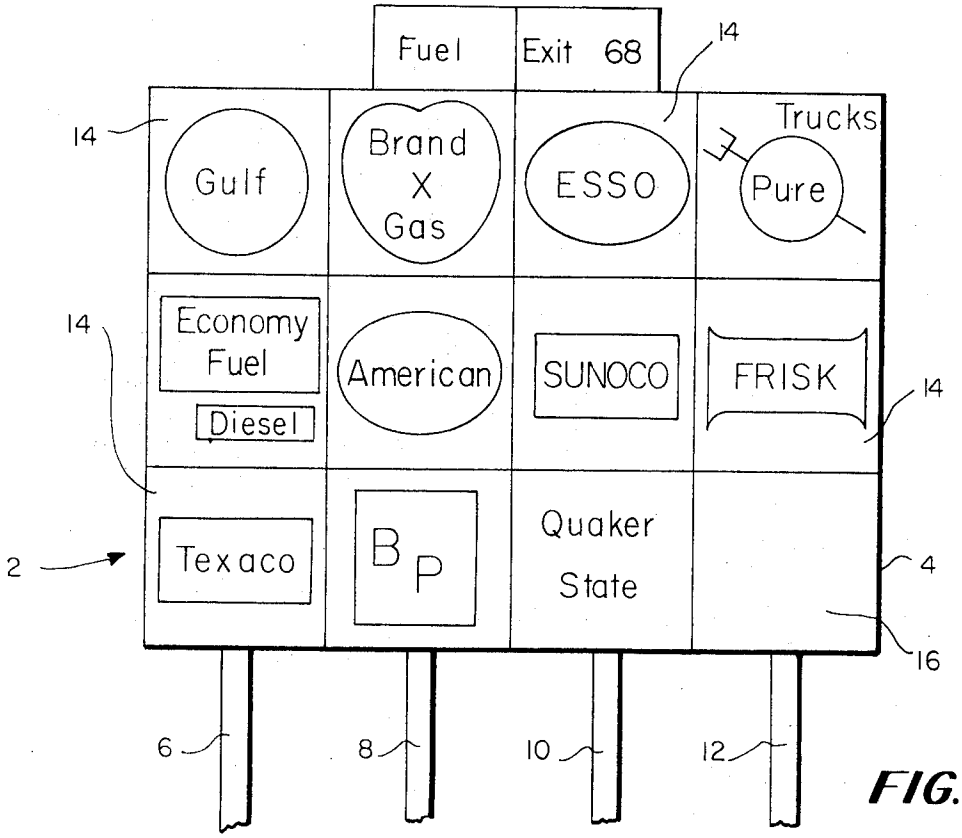


FIG. 1

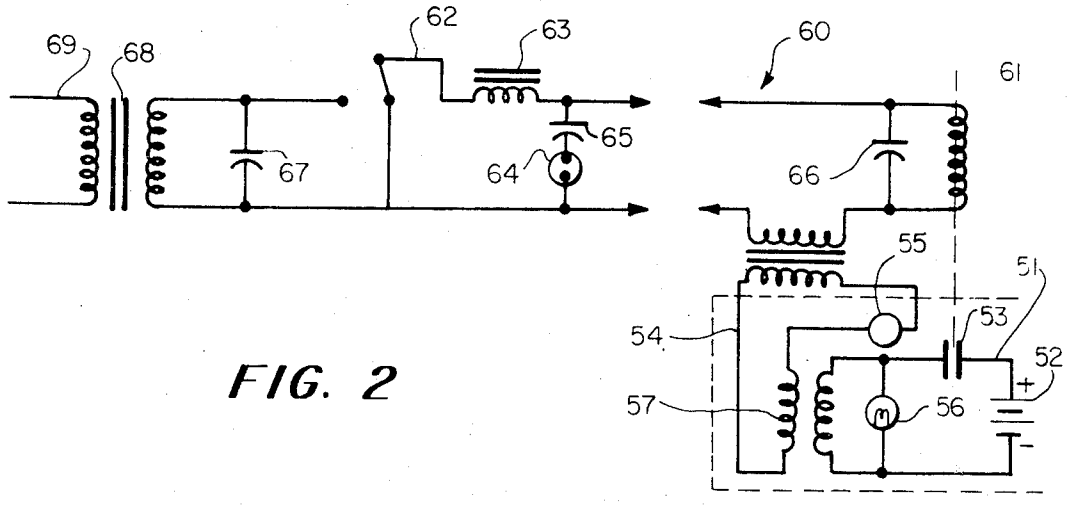


FIG. 2

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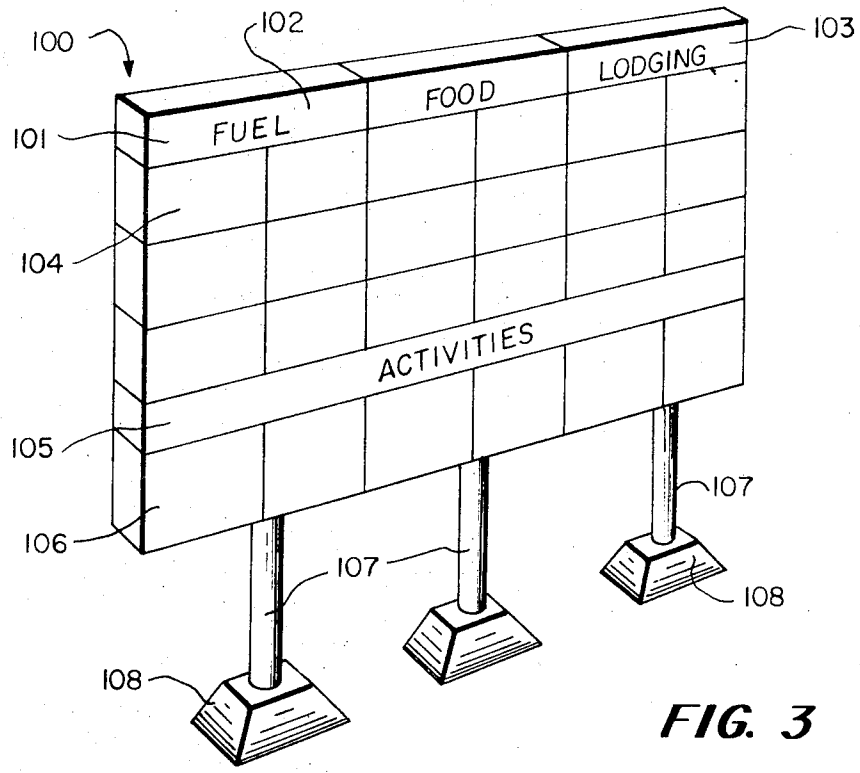


FIG. 3

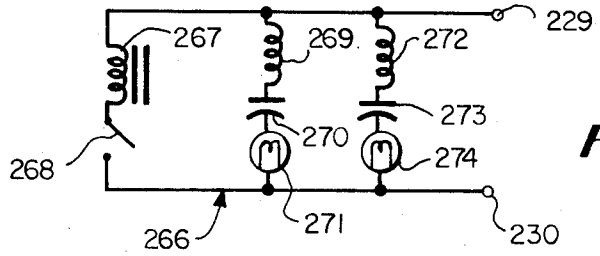


FIG. 5

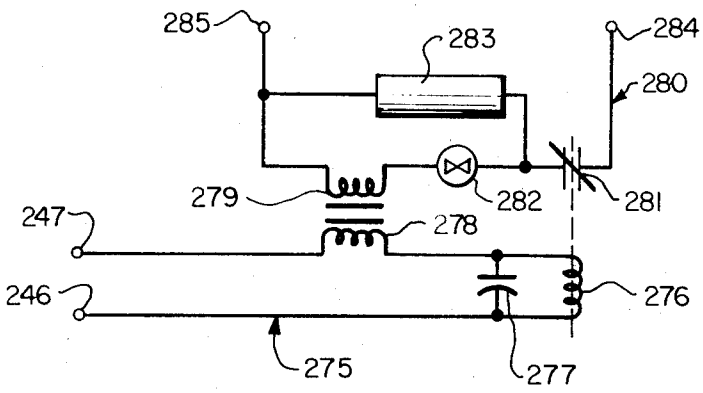


FIG. 4

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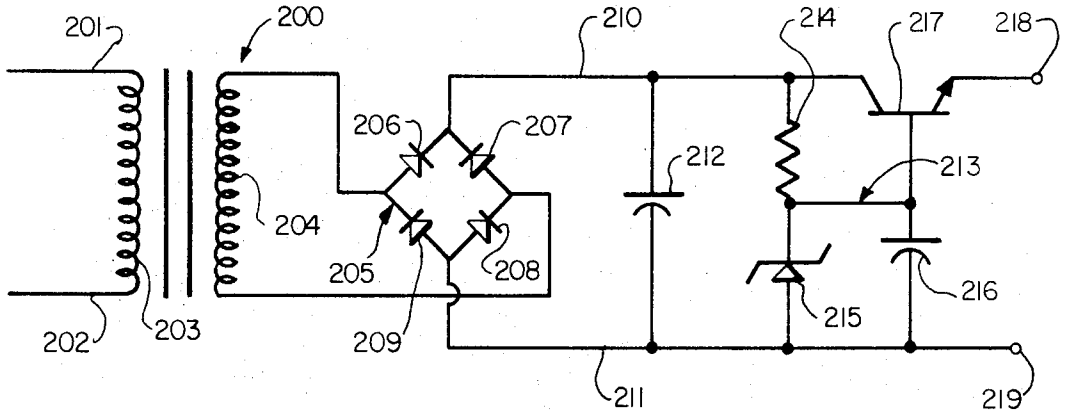


FIG. 6

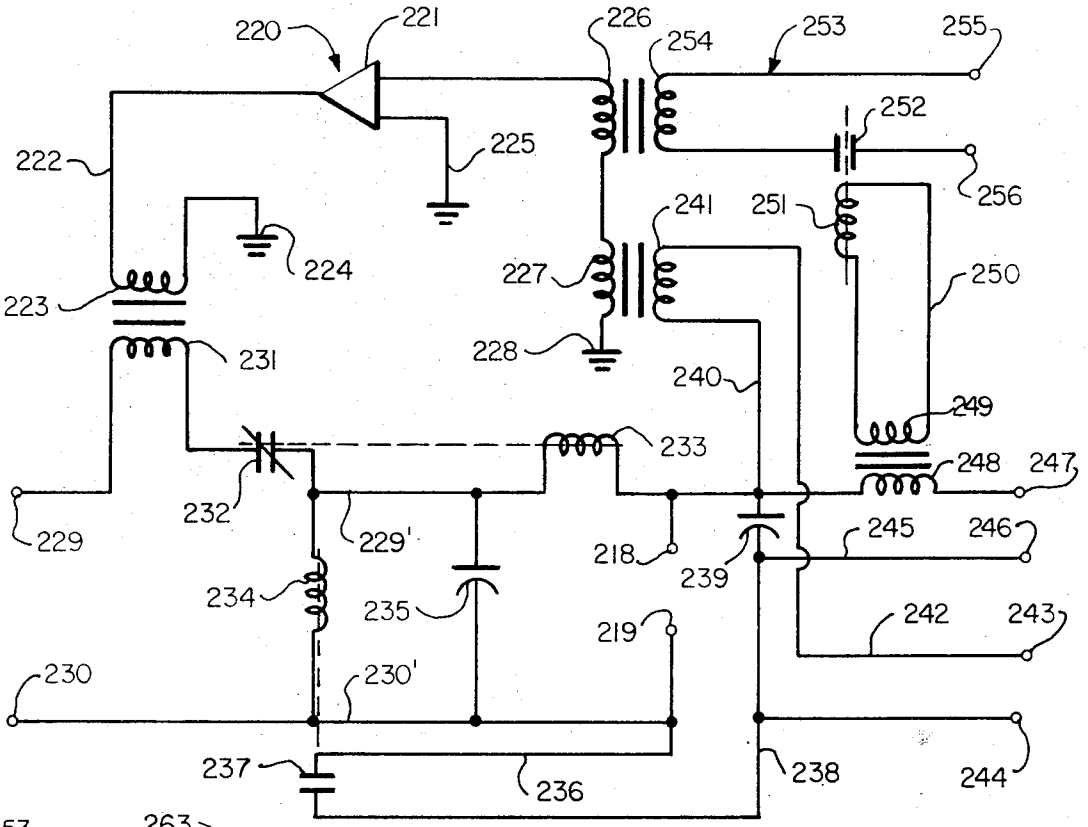


FIG 7

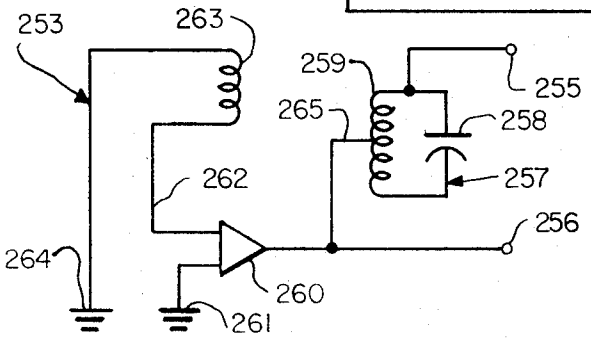


FIG 8

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HIGHWAY SIGN SYSTEM

This invention relates to signboards designed for use on limited access highways and city bypasses.

One of the major problems confronting users of modern high speed limited access highways is the absence of information along the highway in the form of signs informing the viewer of the availability of fuel, rest stops and lodging. While there are present signs stating FUEL, FOOD and LODGING, these are not informative enough to provide the average motorist with information he needs. For example, with the widespread use of gas credit cards, the motorist needs to know what type of gas station is off the highway so that he may avail himself of his particular credit card. Another failure of such signs concerns lodgings. While certain motels have their own credit cards or accept certain ones, there is no indication of what type of facility, such as a chain motel, awaits the motorist who turns off the highway. A further problem in relation to hotels or motels is that there is no manner of telling if a facility has vacancies or, if it is a gas station, whether it is still open.

The problem with locating restaurants is very similar to the problems surrounding motels. There is no manner in which the motorist can ascertain what type of restaurant is available, how many or whether it is open if the motorist happens to be traveling at night.

The present philosophy surrounding highway construction is to provide either closed or limited access highways to accommodate a large number of vehicles traveling at high speeds. The right of ways have been purposely made wide to prevent private ownership of the land immediately adjacent the highway. The reasoning behind all of this is to eliminate (1) a large number of private enterprises from building on the road thus providing a dangerous condition with through accesses, and (2) billboards plastered all over the adjoining landscape and providing a serious distraction to the operators of vehicles traveling at high speeds.

Aside from the disadvantages to motorists, the present systems offer problems for businesses offering these services. In many States, it is necessary to meet certain criterion before qualifying for the presently authorized signing program. Understandably, many Stage agencies have found it necessary to establish certain arbitrary rules governing the operations of these establishments such as setting specific hours of operation, and the number and quality of facilities for motels and restaurants.

Moreover, unlimited signing does violence to a precious and fading resource, natural beauty. For this reason, special federal legislation has been passed to try and prevent this. One of the major reasons for opposition to this legislation is that motorists have found it necessary to know certain information, such as the availability of food, fuel and lodging. It is believed by the inventor that this system will make the "beautification" laws a reality.

Usually, state and federal regulations allow for only the small signs previously mentioned.

The present invention is in concert with federal and state planning on eliminating eyesores and distractions on the sides of intrastate and interstate highways. It overcomes all of the present disadvantages of the existing signs by providing only one sign advertising all the various services available to the motorist at that particular exit.

The sign board can be made up of one section or a plurality of sections, each displaying the availability of fuel, food, and lodging, respectively, at the particular exit. Each panel within each section would be lighted individually. Each service station, restaurant or lodging facility has its own separately lighted panel. The panels are illuminated from within the sign board and are translucent. The panels generally would have only the symbol representing the type or name of facility. The individual establishments would turn their panel off or on depending on business hours or availability of advertised services.

The individual panel lighting can be controlled by direct cable, remote radio control or by the use of telephone lines.

Accordingly, it is an object of the present invention to provide a highway signboard that is indicative of the available facilities to a motorist.

It is a further object of this invention to provide a highway signboard having a plurality of individually controlled translucent panels for displaying available services at each exit to motorists using the highway.

It is still a further object of this invention to provide a novel arrangement by which individual facilities can advertise their existence and availability to users of a limited access highway.

These and other objects will become apparent during the following detailed description of the invention with reference to the drawing in which:

FIG. **1** is a front view of a signboard showing board displaying fuel advertising panels;

FIG. **2** is a diagrammatic view of the circuitry of this invention;

FIG. **3** is a perspective view of an alternative signboard;

FIG. **4** is a diagrammatic view of the user circuitry of the preferred embodiment;

FIG. **5** is a diagrammatic view of the lighting panel circuitry of the preferred embodiment;

FIG. **6** is a diagrammatic view of the power circuitry of the preferred embodiment;

FIG. **7** is a diagrammatic view of the main control circuitry of the preferred embodiment;

FIG. **8** is a diagrammatic view of the oscillation circuit of the preferred embodiment.

Referring now to FIG. **1**, there is shown a signboard **2** having a main section **4** supported on a plurality of legs **6**, **8**, **10** and **12**. The main section **4** has a plurality of panels **14**. Each panel is made of a translucent material such as lucite, etc. Some panels, such as **16**, may not be used since the main section **4** will be of several standard sizes and of a given number of panels and the number of advertisers may not be sufficient to fill up the panel.

On top of the signboard, a separate exit sign **18** may be placed giving information as to the exit number, etc.

Referring now to FIG. **2**, there is shown the control circuitry **50** for the signboard. In the signboard **2** there is provided a DC circuit **51** connected to a power source **52**. A relay contacts **53** is controlled by an induction coil **61** on AC circuit **60**. A separate circuit **54** with a detector **55**, such as a photocell, is activated when the light **56** is on. Circuit **54** receives its power from circuit **51** through a transformer **57**. Circuit **54**, when the light is on, produces a signal in circuit **60**.

Circuit 60 preferably uses a telephone tie line since control and monitoring integrity is maintained and it saves installing separate DC control systems. With the use of the telephone lines, however, the two frequency system is needed. This is the reason for the detector circuits which provide for the dial tone and bell tone. In addition, normal telephone service is much cheaper for up to three miles.

The actual control signal is a D.C. signal while the monitoring is on an A.C. signal.

Circuit 60 has the normal telephone circuit switch 62 and inductance coil 63. An A.C. detector 64 is mounted across circuit 60 in combination with a capacitor 65. Capacitors 66 and 67 are also mounted across circuit 60. The circuit 60 receives its power via coils 68 from a 110 volt A.C. power source.

The individual operator simply dials to light his particular panel on the signboard. When he wishes to close his establishment, he again dials and the light in the appropriate panel goes off, thus informing any passing motorist that the facility is closed.

A preferred embodiment is shown in FIGS. 4–8. Referring directly to FIG. 6, there is shown a power circuit 200. Lines 201 and 202 carry AC current to inductance coil 203 which is transformed to DC current by coil 204 and bridge circuit 205, the latter having four diodes; 206, 207, 208 and 209.

Lines 210 and 211 originating from bridge circuit 205 have capacitor 212 mounted thereacross and a parallel circuit 213 therebetween. Circuit 213 contains resistor 214, transistor 217, capacitor 216 and zener diode 215. Circuit 200 supplies power to the light panel control lines and the remote control circuit through terminals 218 and 219, as shown in FIG. 7.

Referring now to FIG. 7, there is shown the main control circuit 220 which has an amplifier 221 having lead 222 connected to inductance coil 223 and to ground 224. A second lead of amplifier 221 is grounded as at 225. A third lead is connected to ground 228 through inductance coils 226 and 227.

Terminals 229 and 230 are adapted to connect via telephone lines to a remote control circuit as shown in FIG. 5. The line from terminal 229 has coil 231 thereon which receives signal via coil 223 from amplifier 221. Connected in series with coil 231 are normally closed relay contacts 232 which lock open if a short is detected by coil 233.

Connected in parallel across the lines 229' and 230' are coil 234, capacitor 235, power circuit 200 (as shown by terminals 218 and 219) and capacitor 239. The normally open relay contacts 237 are connected via lines 236 and 238 to line 230'. Coil 234 acts to activate relay contact 237, which is the main control relay. Both the short detector relay 232 and the main control relay 237 must be adjusted for the circuit.

A pair of lines, one of which is 242, are attached across lines 229' and 230' and terminate in terminals 243 and 244 which are adapted to be connected to a light panel mounted on the signboard. Line 242 has a coil 241 thereon which is in inductive relationship with coil 227 connected in turn with amplifier 221.

A second pair of lines, one being 245, originate in terminals 246 and 247. An inductance coil 248 is attached to one of the lines and is in inductive relationship with coil 249 of closed circuit 250. Terminals 246 and 247 are adapted to be attached to a second light panel mounted on a second signboard, there being two signboards, one for each direction of traffic.

Closed circuit 250 has a second coil 251 thereon which, when energized, activates relay contacts 252, having normally open contacts on oscillator circuit 253. As seen in FIG. 7, circuit 253 has a coil 254 thereon in inductive relationship with coil 226 which is connected with amplifier 221. The oscillator circuit is shown in two figures, 7 and 8, with terminals 255 and, in FIG. 7, 256, corresponding to the same identified terminals in FIG. 8. Circuit 253 is coupled to an inductance circuit 257 consisting of coil 259, lead 265, capacitor 258 and single stage audio amplifier 260. Line 262 from amplifier 260 has coil 263 thereon and terminates in ground 264. Amplifier 260 is also grounded as at 261.

Referring now to FIG. 5, there is shown a typical remote control user circuit 266. Terminals 229 and 230 correspond to those in FIG. 7, it being understood that circuit 266 is connected to circuit 220 via telephone lines. The circuit has an inductance 267 and switch 268 mounted in parallel with two signal circuits, the first containing coil 269, capacitor 270 and lamp 271 and the second containing coil 272, capacitor 273 and lamp 274. The power for the circuit 266 is supplied by the central control circuit 220 and circuit 200.

Referring now to FIG. 4, there is shown a sample light panel activator and detector 275 circuit. Terminals 246 and 247 correspond with the same numbered terminals in FIG. 7, it being understood that the actual connecting lines would preferably be underground cable. Circuit 275 has a coil 276 thereon and a capacitor 277 in parallel therewith. An inductance coil 278 is in inductive relationship with coil 279 of the lighting portion 280 of the circuit 275 which also contains a fluorescent light 283 to illuminate the users sign, a photocell 282 which is activated by the light 283 to tell the user if the light is working and a relay 281 having contacts which are activated by coil 276 when the latter is energized to turn the light off. Relay 281 has normally closed contacts. A 120 volt AC external source is connected between terminals 285 and 289 to illuminate the light 283.

The circuitry 220 is designed such that a user circuit (266) short disconnects his control thereby leaving his lights off. Coil 233 is energized to open relay 232.

When the user closes switch 268 in circuit 266, a specified D.C. load appears to control circuit 220 and coil 234 and causes the relay 237 to close thereby turning the lights, such as 283, on.

When the lights, such as 283, are lit, the light striking the photodetector 282 allows a certain current to flow producing signals through coils 279 and 278 and their counterparts (not shown) to the control circuit 220. The control circuit 220 uses the signals to produce two different frequency signals to be sent to the users circuit 266. This is accomplished through the use of oscillator circuit 253, coils 248, 249, 254, 241, 226, 227, 223, and 231, amplifier 221 and relay 252.

The control circuit sends the modified frequency signals to the users circuit 266 to illuminate lamps 271 and 274.

The existence of only one signal frequency at the users circuit 266 obviously turns only one light on. Thus, the user can determine if just one or both of his

circuits are working. Of course, it is understood that in the case of a major interchange between two highways, at least four signs can be employed.

FIG. 3 shows an alternative signboard **100** in which there are separate sections for various facilities. Section **101** is a fuel section in which individual panels, such as **104**, display gas stations open off the highway. Section **102** is a food section for advertising restaurants and section **103** advertises motels or hotels. A fourth section **106** may be used by the township to advertise what is available, such as tourist spots, circuses, carnivals, etc. Signboard **100** is supported on a plurality of pipes **107** buried in concrete reinforcements **108**.

The signboards can be constructed of any suitably material, such as steel, plastic, or even wood. They should be sturdy enough to withstand the elements.

It will be apparent to those of ordinary skill in the art that many changes and modifications can be made to the instant invention without departing from the scope of the appended claims.

What is claimed is:

1. A remotely controlled sign system for informing motorists of limited access highways of the facilities available at each exit, said system comprising a signboard having a substantially vertical face, a plurality of individual panels in said signboard face, a plurality of lighting means in each panel, each panel having a translucent pane with indicia thereon, a power circuit means for each lighting means, said power circuit means being connected to each said means by individual first switch means, relays to operate said first switch means, a remotely located power source, second switch means for each relay also remotely located to operate said relays and said first switch means responsive thereto.

2. A system as in claim **1** wherein said first power source is D.C. and said second power source is an A.C. source.

3. A system as in claim **1** including a detector means in the locale of said second switching means, said detector means adapted to signal when said lighting means is on.

4. A system as in claim **3** wherein said first power sources connected to said lighting means are D.C. power sources and said second power sources connected to said relays and said detector means are an A.C. source.

5. A system as in claim **4** wherein said detector means comprises a control rectifier operated by said D.C. power source, said rectifier being connected to a photodetector adapted to be activated by said lighting means, a detector element in the locale of said second switching means and adapted to be activated by a signal from said photodetector.

6. A system as in claim **5** including an oscillatory means controlled by said photodetector for providing an oscillatory signal to activate said detector element; said detector element includes a tuned detector and a lamp in series such that said oscillatory signal activates said tuned detector which activates said lamp.

7. A system as in claim **5** wherein said second switching means functions to turn said lighting means on in a first position and allows said detector means to operate in said second position.

8. A remotely controlled sign system for informing motorists of limited access highways of the facilities available at each exit, said system comprising a signboard having a substantially vertical display surface, said surface comprising a plurality of individual advertising panels with indicia thereon, illuminating means associated with each panel to illuminate the indicia on each panel, each illuminating means having a separate power circuit and a control circuit means remote therefrom for turning said illuminating means on and off and means associated with said individual advertising panels for signalling said remote controller whether the individual advertising panel is illuminated.

9. A system as in claim **8** including means for supporting said signboard above the ground.

10. A system as in claim **8** wherein said control circuit means comprises a D.C. circuit means including said power source connected to said illuminating means for activating the same, a relay in said D.C. circuit, an A.C. circuit including a power source, a detector circuit and a switch and adapted to activate said relay for activating said D.C. circuit and said illuminating means, said detector circuit including a photodetector means activated by said D.C. circuit and adapted to cause a pulse signal in said A.C. circuit if said illuminating means is lit.

11. A remotely controlled illuminated sign system for informing users of limited access highways of the facilities available at each exit, said system comprising two signboards, each one adapted to face opposite lanes of oncoming traffic, said signboards having a substantially vertical display surface, said surface comprising a plurality of individual advertising panels with advertising indicia thereon, an illuminating circuit means associated with each panel for illuminating said indicia on each panel, each illuminating circuit means having its own power supply, a central control circuit means for energizing said illuminating circuit means associated with each said advertising panel to light corresponding panels on both signboards, and a plurality of individual advertiser circuit means remote from said central control circuit means and said signboards for activating said central control means.

12. A system as in claim **11** wherein each individual advertiser circuit means has two indicator means therein, each indicator means corresponding to said advertiser's panels on the two respective signboards, said illuminating circuit means and said control circuit means adapted to activate said indicator means to inform the advertiser if his panels are illuminated.

13. A system as in claim **1** where said central control circuit means, upon receiving a signal from either of said signboards, is adapted to send a frequency signal to said advertiser circuit means to activate said indicator means.

* * * * *