

[54] **SAFE-TO-PASS INDICATOR HAVING PORTIONS OF INDICIA FLASHINGLY ILLUMINATED**

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[51] Int. Cl.**B60q 1/00**

[58] Field of Search.....**340/107, 74, 106**

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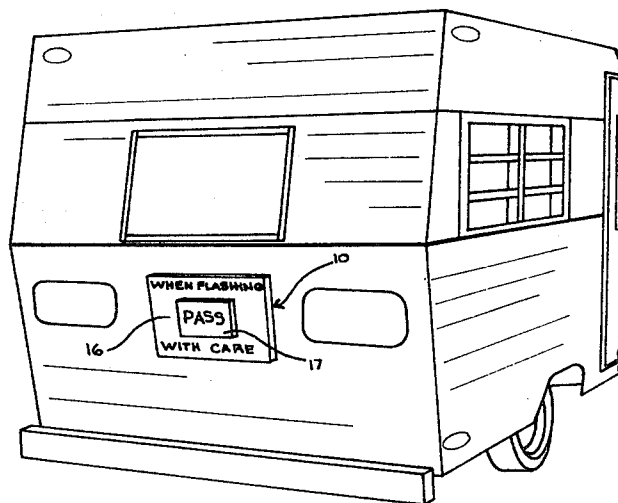
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[57] **ABSTRACT**

A safety device for indicating from a lead vehicle to following drivers when it is safe to pass. The control means for the device is spring loaded to the off position for safety reasons and all of the wording on the safe-to-pass indicator are clearly visible when the sign is both off and on. A transistorized multi-vibrator is used to activate flashing light indicators.

10 Claims, 7 Drawing Figures



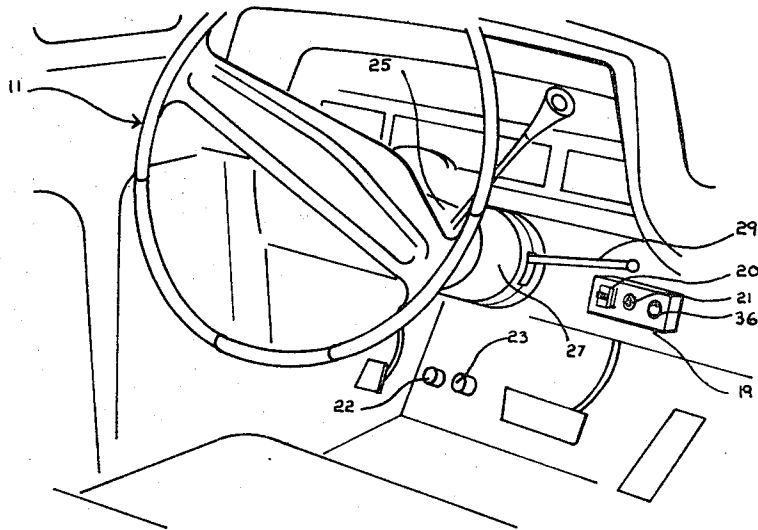


Fig. 1

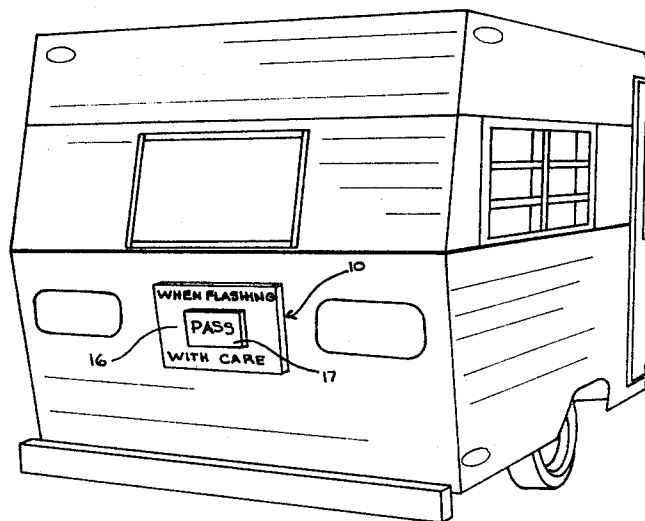


Fig. 2

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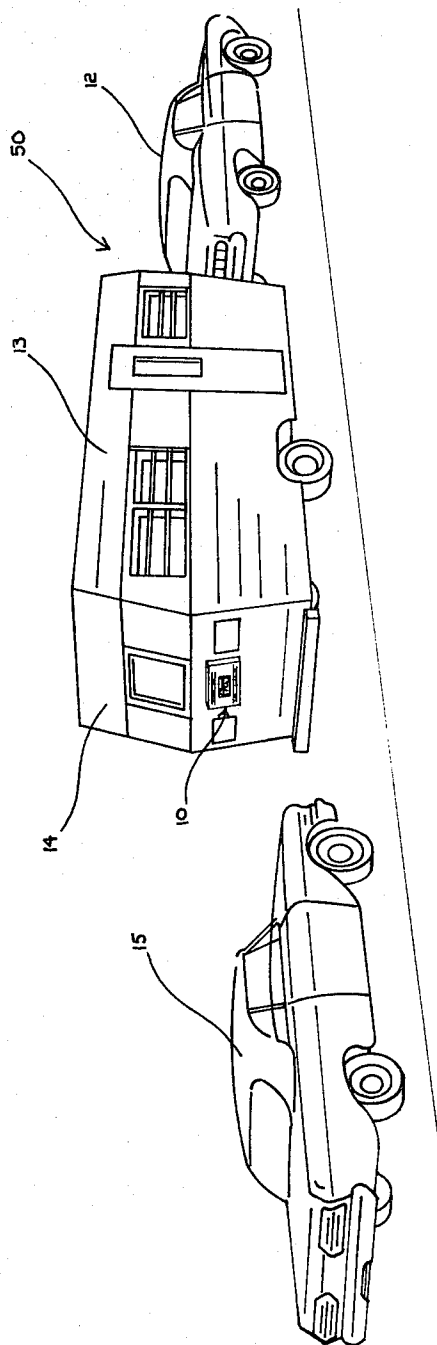


Fig. 3

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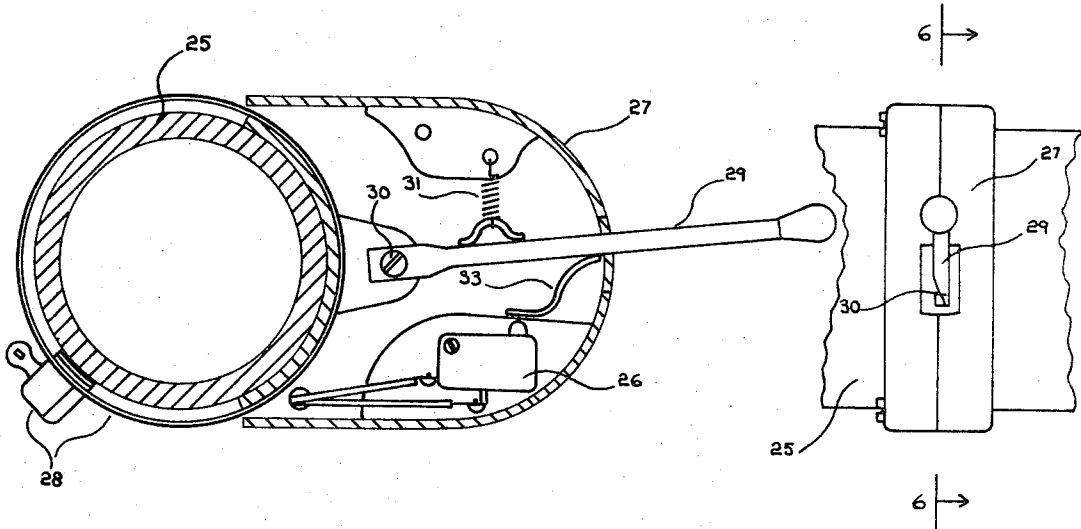
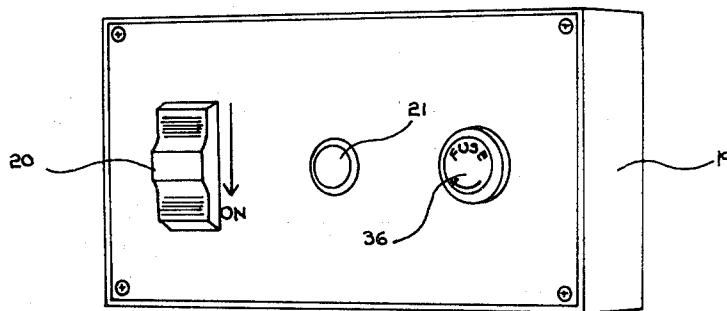


FIG. 6

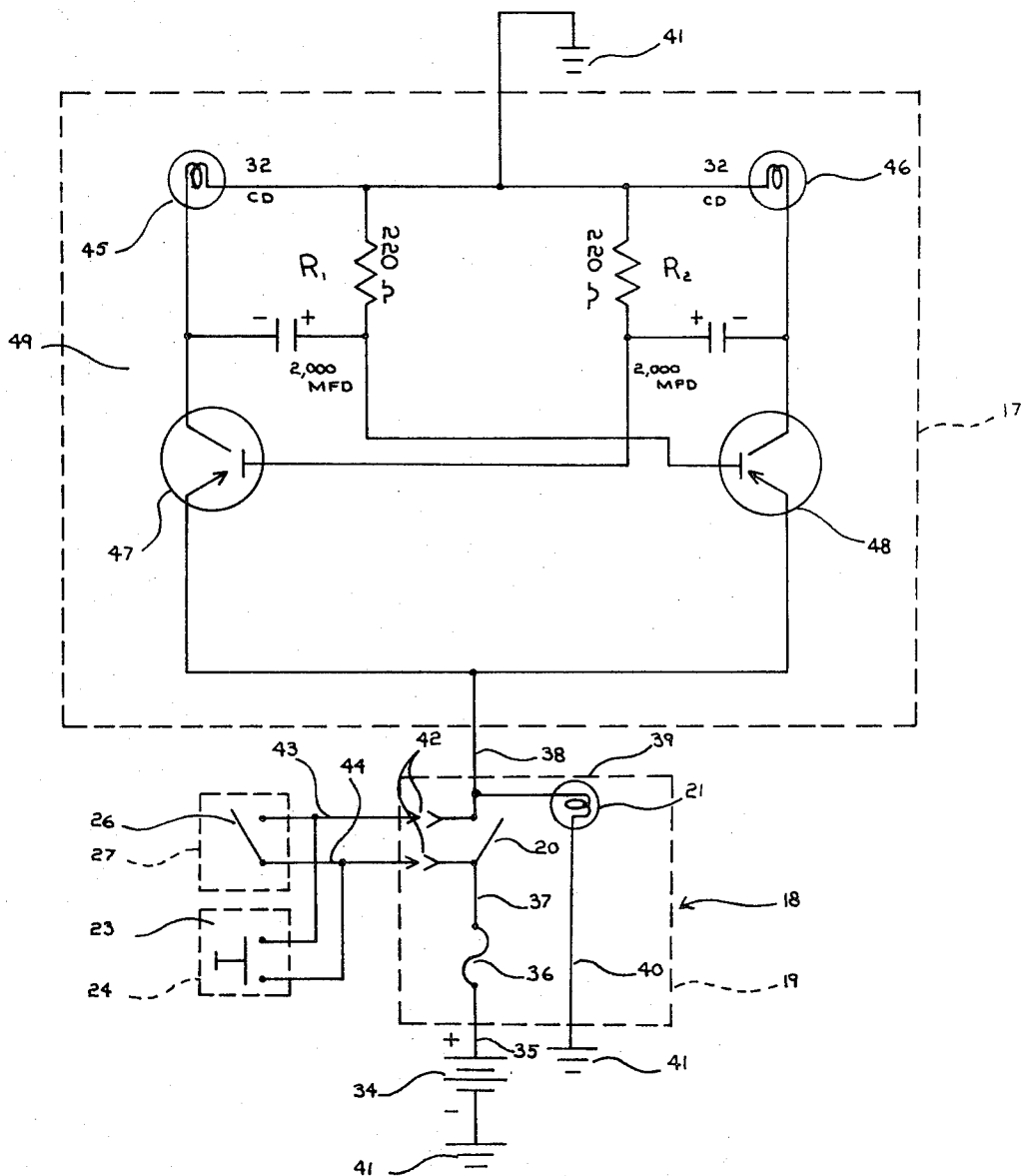
FIG. 5

FIG. 4



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SAFE-TO-PASS INDICATOR HAVING PORTIONS OF INDICIA FLASHINGLY ILLUMINATED

This invention relates to safety devices and more particularly to safety indicators used on lead vehicles to notify following drivers when a safe passing condition exists.

Over the years, truck drivers, as well as the drivers of other large and generally slow vehicles, have attempted to signal following drivers to pass by the use of forward motioning hand signals. This has generally proved completely inadequate, however, since the following vehicle must move out from behind the lead vehicle a sufficient distance for the driver to see the hand signal. This is even more difficult to safely accomplish when curving or winding roads are being traveled.

In recent years, various attempts have been made to produce a safe and yet efficient means to indicate to drivers following a vehicle, particularly large slow vehicles, when it is safe to pass. These contrivances have included flashing arrows, words that light up, and similar systems. These systems, however, have been inherently dangerous in that the driver of the lead vehicle may forget to turn the device off thus falsely indicating a safe condition. Likewise, the drivers of the following vehicles have generally not been aware that the lead vehicle was equipped with a safe passing indicator and thus available time is used up when the driver must digest what the sign says and make his decision whether to attempt to pass or not. As quite often happens, by the time this process has been completed, it is again unsafe to attempt such a maneuver.

The present invention has been developed after much research and study into the above mentioned problems and is designed to provide a remotely activated, electronically operated, safe-to-pass indicator that allows the driver of the following vehicle to be aware that the lead vehicle is so equipped and thus be prepared to proceed when a passing condition signal is given. The present invention also prevents the following driver from becoming confused as to the function or manner of operation of the safe-to-pass indicator. Because of build-in safety features, an erroneous safety condition indication cannot be given. This is accomplished by providing an off biased safe-to-pass control switch coupled with a quick disconnect power line fused and a system operation condition indicator. The safe-to-pass sign itself is uniquely designed so that its complete message is at all times visible to the following motorist and yet, because of such wording, it is obvious when it is safe and when it is not safe to execute a passing attempt.

It is an object, therefore, of the present invention to provide a safety device to aid following vehicles in passing lead vehicles.

Another object of the present invention is to provide a vehicle safe-to-pass indicator wherein all of the wording thereof is at all times clearly legible to following vehicles.

Another object of the present invention is to provide a safe-to-pass indicator which is so worded that the driver of following vehicles are not prone to confusion relative to the meaning thereof.

Another object of the present invention is to provide a dual safety system for a vehicle safe-to-pass indicator.

Another object of the present invention is to provide an off biased control switch for a vehicle safe-to-pass

indicator system coupled with a twist disconnect power line fuse holder.

A further object of the present invention is to provide a flashing to pass indicator signal for following vehicles.

An additional object of the present invention is to provide a transistorized multi-vibrator controlled flashing signal for indicating a safe passing condition to a following vehicle.

Another object of the present invention is to provide a control means for a safe-to-pass indicator which is operated from either a floorboard mounted switch, an instrument panel mounted switch, or a steering column mounted switch.

Another object of the present invention is to provide a condition status indicator for the operator of a vehicle safe-to-pass signaling system.

Other objects and advantages of the present invention will become apparent and obvious from a study of the following description and the accompanying drawings which are merely illustrative of such invention.

In the drawings:

FIG. 1 is a cutaway perspective view of a typical motor vehicle operator's station showing three possible locations of the control portion of the safe-to-pass indicator of the present invention.

FIG. 2 is a fragmentary rear perspective view of a vehicle showing the sign portion of the safe-to-pass indicator of the present invention;

FIG. 3 is a perspective view of a safe-to-pass indicator equipped lead vehicle and its relationship to a following vehicle;

FIG. 4 is a front perspective view of the dash mounted control console;

FIG. 5 is a front elevational view of the steering post mounted control means;

FIG. 6 is a section taken through lines 6—6 of FIG. 5; and

FIG. 7 is a schematic of electrical system of the present invention.

With further reference to the drawings, the safe-to-pass indicator of the present invention includes a signal portion indicated generally at 10 and control means mounted conveniently at the operator's station indicated generally at 11. The system of the present invention can be used either with a towing vehicle 12 operatively connected to a towed vehicle 13 or can be used with any other vehicle, particularly ones that may be driven slowly and are bulky in size such as trucks (not shown) and the like. Whether articulated or not, the signal equipped vehicle will hereinafter be referred to as lead vehicle 50 and the signaled to vehicle as the following vehicle 15.

Although it could take any one of several forms, the pass sign 10 has been found effective when constructed from a basic mounting board 16 with the words "ITS SAFE TO" printed on the upper portion thereof and the words "WHEN FLASHING" on the lower portion. In the center of the sign is the word "PASS" clearly printed on a translucent housing 17. Within this housing is disposed at least one lamp and means for causing the same flash on and off such as that disclosed schematically at 49 in FIG. 7.

The sign 10 can either be permanently or removably secured to the rear 14 of its associated lead vehicle 50. Permanent mounting, of course, can be in any conventional form such as screws, bolts or even an adhesive or welding. If the sign is to be removably attached, this, of course, can be accomplished by providing special brackets, removable hinge means, or even magnetic type holders.

The control unit indicated generally at 18 can take several forms. If the unit is dash mounted, it would preferably have a housing 19 and would include a spring loaded, off biased, switch 20 of standard construction, a pilot light 21 to indicate the operating status of the system, and a standard twist-to-disconnect power line fuse.

Since the fuse and pilot light should be conveniently mounted, they would preferably always be located in the area of the dash. The control switch, however, can be located in other positions and on occasion preferably would be. One possible alternative is to mount the same on the floorboard in a similar manner to, and adjacent the headlight dimmer switch 23. This floor mounted switch 24 would be of push button type construction and biased to the off position as switch 20 was indicated as being. A housing indicated at 24 could, of course, be provided to protect the working portion of the switch.

Another location for the off-on switch of the present invention is on the steering column 25 of vehicle 12. This steering column switch indicated at 25 would be mounted within a housing 26 and be secured to the column by means such as clamp 28.

As to the structural details of a steering column type switch, the control lever 29 shown in FIG. 6 is pivoted about screw retained 30. This lever is biased by spring 31 away from the standardly constructed microswitch 32. A presser arm 33 is fixedly secured to the control lever and is adapted to operatively engage the microswitch when the lever is moved against the biased of spring 31. Thus it can be seen that the circuit through the microswitch will only be completed while positive "on" pressure is applied to control lever 29.

With specific reference to the electronic circuitry disclosed schematically in FIG. 7, the vehicle battery 34 is preferably used as a power source. This source can be either 6, 12 or 24 volts although the values of the components are given for a 12 volt system which is, of course, the most widely used voltage for motor vehicles.

Also since most vehicles use a negative ground, this has been shown although it is understood that with obvious modifications, a positive ground system could be made to work equally as well.

Line 35 from the positive side of the battery 34 passes into the interior of control housing 19 and is connected to one side of the twist disconnect fuse 36. The other side of the fuse is connected by line 37 to one side of off-biased switch 20. The other side of switch 20 is connected to one end of line 38 which extends out of housing 19 and to the rear 14 of lead vehicle 50, whether a combination unit or a single unit. This line then passes into the translucent housing 17 and is operatively connected to the flashing system 49 as will hereinafter be described in detail.

Within the control unit 18 is pilot light 21 connected on one side by line 39 to line 38 on the other side by line 40 to ground 41.

If either the steering column switch or the floorboard switch is used, a plug type connection indicated at 42 would be used. The two lines 43 and 44 would thus extend, one from line 35 and one from line 38 so that switch 20 can be by-passed. Lines 43 and 44 lead one to each side of either floor mounted switch 23 or steering column mounting switch 26 or to both, in parallel if both are used. Thus it can be seen that either a dash mounted switch 20, a steering column mounted switch 26 or a floorboard mounted switch 23 or a combination of all or part of these switches can be used to activate the flasher unit 49 connected to line 38.

The flasher portion of the indicator system of the present invention includes a pair of lights or lamps 45 and 46 and a multivibrator system to flashingly operate the same. The flasher unit itself is a collector-coupled transistor multivibrator in the form of a two stage resistance-capacitance coupled emitter amplifier with the output of the first stage coupled to the input of the second stage and the output of the second stage coupled to the input of the first stage. This regenerative feed back with amplification is, of course, required for oscillation. Bias and stabilization are established identically for both transistors 47 and 48.

The transistors referred to above are the TO-36 or the TO-36 type, according to the power requirement of the lamps used. The rate of flash of these lamps is controlled by R1, C1 and R2, C2 combinations at 60 flashes per lamp per minute or at the rate of one flash per second.

Because of variations in the tolerances of the components, one transistor will conduct before the other. Assuming transistor 47 is conducting more heavily than transistor 48, more current will flow in the base circuit of transistor 47 than the base circuit of the transistor 48. Collector current in transistors 47 will thus increase rapidly, causing collector voltage at the junction of lamp 45 and resistor-capacitor R1, C1 to decrease or become more positive. This increasing positive voltage is applied through C1 to the base of transistor 48 thus at the same time turning on lamp 46.

As the base voltage of transistor 48 become more positive, the forward bias decreases, resulting in a rapid decrease in the base current and thus the collector current in transistor 48. Collector voltage at the junction of lamp 46 and resistor-capacitor R2, C2 becomes more negative. This negatively increasing voltage is fed back through capacitor C2 to the base of transistor 47 thus increasing the forward bias.

From the above, it is obvious that as long as the operator of the signal equipped vehicle holds the spring loaded control switch in the "on" position so that battery current can flow to the above described flasher means, the lamps 45 and 46 will emit flashing signals.

As heretofore indicated, ground potential is the same for both the negative side of the battery, the ground side of pilot light 21, and the ground side of the flasher unit 49.

To install the safe-to-pass indicator of the present invention on a vehicle or combination articulated vehicle, all that is required is for the pilot light-fuse circuitry contained within housing 19 to be mounted on

the dash of such vehicle convenient to the operator's station 11. If control switch 20 is to be used then no other installation in this area is required. If it is desired, however, to use either the steering column switch 26 or the foot operated switch 23 or both, lines 43 and 44 must be plugged into connection 42 contained within housing 19 and run to the respective location of such switches which can then be installed in the accepted manner. Line 35 running from housing 19 is attached to any convenient power connection that extends to battery 34 of the vehicle. The circuitry within the housing 19 would also be grounded at some convenient location on the vehicle body.

Line 38 is then run from housing 19 to the safe-to-pass sign 10 conveniently mounted on the rear 14 of vehicle 50. If the indicator system is used with an articulated vehicle, electrical connection can readily be made through the standard power plug connection that controls signal lights, running lights, brake lights and the like on vehicle 14. Line 38 is finally connected to the flasher unit 49 contained within translucent housing 17 and this circuitry properly grounded.

As the safe-to-pass indicator equipped vehicle indicated at 50, which can be either articulated or non-articulated, is driven on the highway, the driver or operator thereof can activate either dash switch 20, steering column switch 26, or floor switch 23 (as equipped and desired) to send electrical current to the flasher unit 49. This unit causes lamps 45 and 46 to flash thus periodically eliminating the translucent housing 17 which has printed thereon the word "PASS". Since the indicia on the sign 10 states "WHEN FLASHING PASS WITH CARE", the periodic illumination or flashing of the "PASS" signals the driver of the following vehicle 17 that the driver of the lead vehicle 50 considers it safe to attempt a passing maneuver. The wording on the safe-to-pass sign 10, however, is so designed that it does not indicate an absolute safe to pass condition but only indicates that it is safe to attempt to pass while using caution. The reason for this carefully worded indicia is, of course, due to the fact that it can appear that a safe passing condition exists but this can rapidly change if an oncoming vehicle is traveling at an excessive rate of speed, pulls out from a side road, or for any number of other causes.

As soon as the operator of the lead vehicle notes that it is no longer safe for the driver of the following vehicle to attempt to pass, he releases pressure on the closed control switch which automatically allow such switch to open thus cutting off current to the safe-to-pass sign 10 which in turn stops the flashing of the word "PASS" written on the translucent housing 19.

From the above, it is obvious that the present invention has the advantage of providing a simple yet efficient means of indicating to the driver of a following vehicle when the road in front of the lead vehicle appears to be clear for safe passing. The present invention is also designed to prevent possible driver confusion as to the meaning of the indication being given. The present invention additionally has the advantage of being relatively simple in design which makes it easy to install and service and yet inexpensive to initially purchase. Because of its design and function, the indicator system of the present invention has a wide and

varied vehicular application.

The present invention may, of course, be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

What is claimed is:

1. A safe-to-pass type indicator comprising: a vehicle having a forward portion, a rear portion, and an operator's station; a sign means mounted on the rear portion of said rear portion of said vehicle; message conveying indicia to the effect that it is safe to pass said vehicle when said indicia is flashingly illuminated printed on said sign with all portions of said indicia being at all times clearly visible; means for flashingly illuminating at least a portion of said indicia; means operatively mounted adjacent said operator's station for controlling said flashing means and a system operating condition indicating means operatively connected to said controlling means whereby indicator operational malfunctions may be readily determined.

2. The indicator of claim 1 wherein the control means is biased to a normally "off" position.

3. The indicator of claim 1 wherein at least a portion of the indicia is printed on a translucent housing within which is contained said flashing illuminator means.

4. The indicator of claim 1 wherein said flashing means is a battery intergized, collector-coupled transistor multivibrator operatively connected to lamp type illuminating means.

5. The indicator of claim 1 wherein said condition indicating means is a pilot light.

6. The indicator of claim 1 wherein a secondary disconnect means is provided whereby said flashing illuminator may be rendered inoperation in case of malfunction.

7. The indicator of claim 6 wherein the disconnect means is a quick disconnect type fuse.

8. A safe-to-pass type indicator comprising: a vehicle having a rear portion and an operator's station; a sign means mounted on the rear portion of said vehicle; a message conveying indicia printed on said sign with all portions of said indicia being at all times visible, said indicia conveying a message to the effect that it is safe to pass said vehicle when such indicia is flashingly illuminated; a battery intergized, collector-coupled transistor multivibrator operatively connected to a lamp means for flashingly illuminating at least a portion of said indicia; and switch means biased to a normally "off" position operatively mounted adjacent said operator's station for controlling said flashing illuminating means.

9. The indicator of claim 8 wherein at least a portion of said indicia is printed on a translucent housing within which is contained the flashing illuminating means.

10. The indicator of claim 8 including a pilot light type operating condition indicating means operatively connected to said controlling means and a quick disconnect type fuse operatively connected to said controlling means to render said flashing illuminator inoperative in case of malfunction.

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