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- (54) Lamp failure indicator
- (57) A circuit for indicating the failure of a turn-signal indicator lamp of a vehicle is effective even when the signal indicator system is not in use. A resistance 5 or 15 bypasses the operating switch(es) 11A, 11B, 16 of a lamp 7 or 13 to pass a small monitoring current through the lamp. A tell-tale 3 or 13, connected either across the monitored lamp or between two monitored lamps, is illuminated via the resistance should a lamp fail.

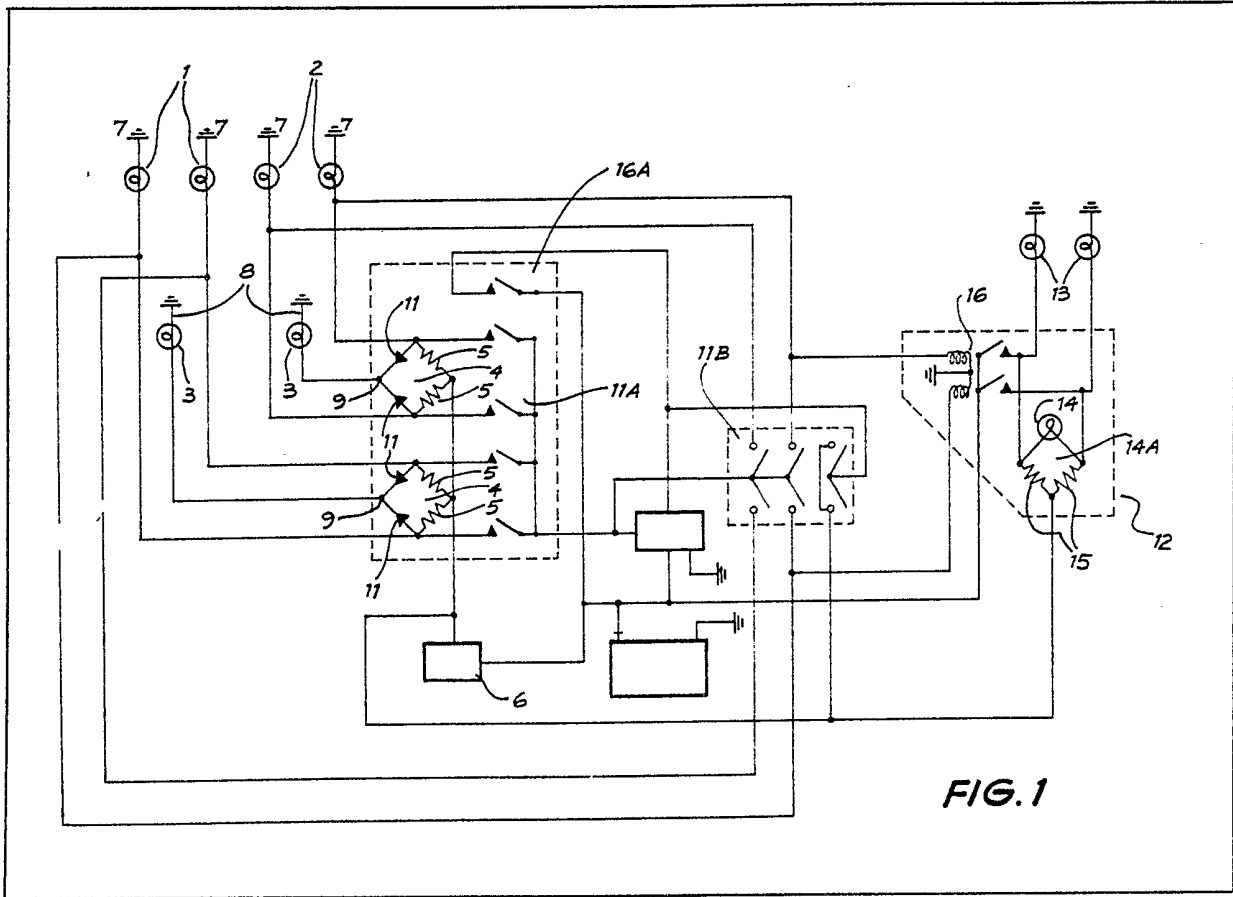


FIG. 1

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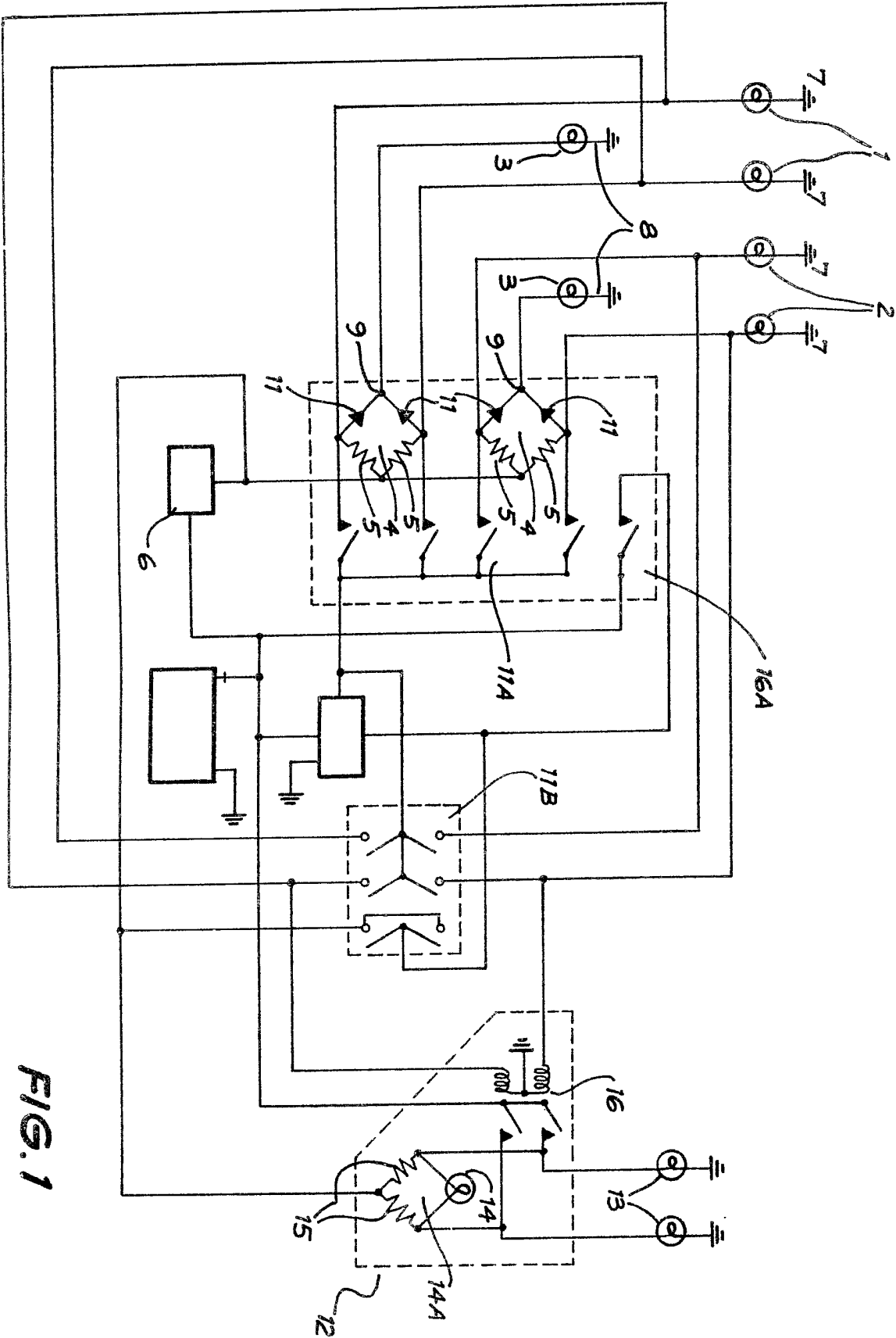


FIG. 1

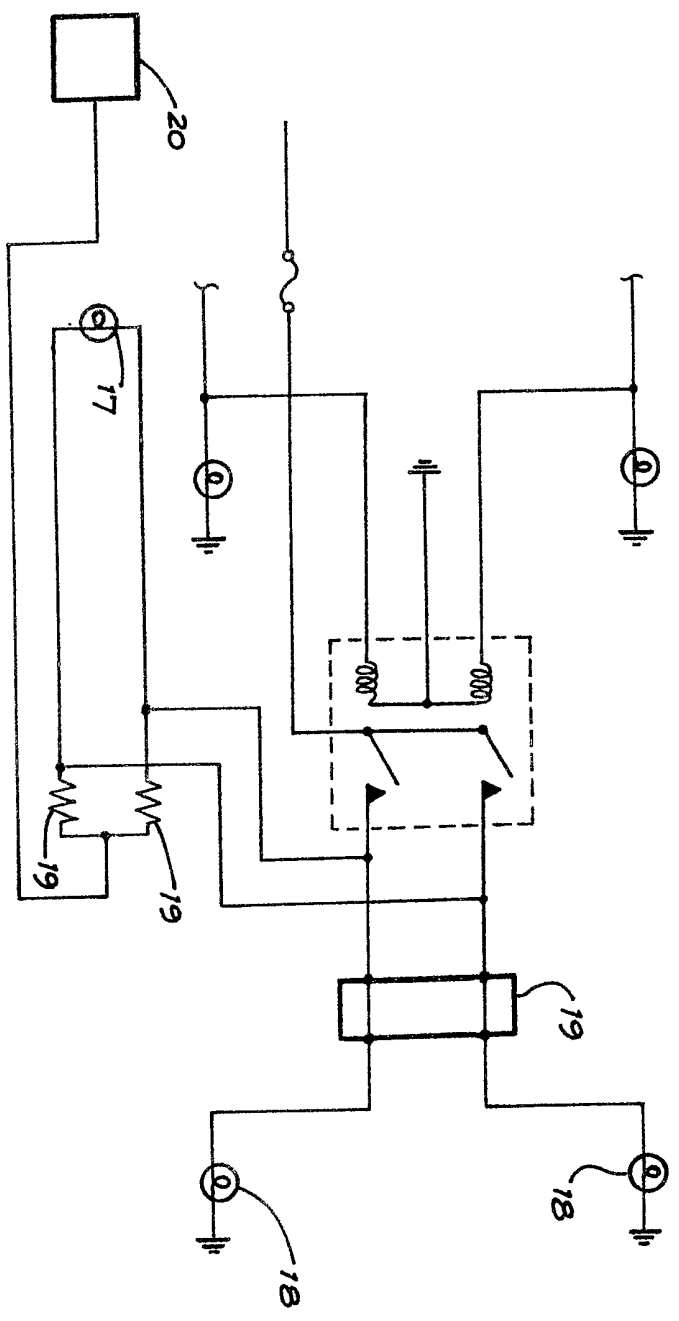


FIG. 2

SPECIFICATION

Signal failure indicator

This invention relates to a turn signal failure indicators for vehicles such as for example towing or hauling vehicles, trailers or caravans.

With conventional flasher units for activation of the turn signal lamps of vehicles the flashing speed is dependent on the load placed on the flasher unit. Thus when the turn signal switch and flasher unit is activated, the flashing speed will vary according to whether one or the other of the turning signal lamps has failed. Optical and/or audible monitoring means is also normally provided to give an indication to the driver that there is a failure in one of the lamps. This monitoring means is referred to in the art as a "Tell-tale".

Such known arrangements have the disadvantage, however, that indication of a turning signal lamp failure is only given, when the turn-signal switch is operated. It is therefore an object of this invention to provide a system whereby the Tell-tale means will also give an indication to the driver of the condition of the turn-signal lamp as soon as the ignition is switched on or the generating system begins to charge prior to the turn-signal switch being operated.

Broadly this invention comprises a circuit for indicating a failure of one or more signal lamps of a vehicle, the circuit being connectible with the ignition or generating system of the vehicle and comprising a Tell-tale means connected in a balanced electrical circuit with the turn signal lamps and a resistance means so that when the turn signal lamps are functional the tell-tale means is inoperative, and the relative resistances of the tell-tale means and the turn signal lamps being such that the failure of one or more of the turn signal lamps upsets the balance of the circuit to cause activation of the Tell-tale means when said circuit is connected to the ignition or generating system.

Preferred embodiments of this invention will now be described with reference to the accompanying drawings in which:

Figure 1, is a schematic diagram of a hauling vehicle and trailer turn signal circuit according to this invention.

Figure 2, is a further schematic diagram of a trailer turn signal circuit according to this invention.

Referring first to Figure 1 there are shown pairs of left and right hand turning signal lamps 1 and 2 for the front and back of a hauling vehicle and separate Tell-tale lamps 3 to monitor the signals on each side. Balanced circuits 4 are associated with each of the lamps 1 and 2 whereby they are connected at the terminal through respective pairs of resistances 5 to the ignition or generating system 6 of a vehicle. The other terminals of the lamps 1 and 2 are connected to earth 7. Each resistance 5 is of such a value that the electrical current flowing from the ignition or generating system 6 through each of the turn signal lamps 1

and 2 to earth 7 is insufficient to illuminate the lamps.

The Tell-tale lamps 3 are mounted in any suitable location observable by the driver. They are earthed at one terminal 8 and connected at the other terminal 9 to the junctions of the respective pairs of resistances 5 and the signal lamps 1 and 2. Unidirectional devices such as diodes 11 are also incorporated into circuit to prevent current flow between each pair of turn signal lamps 1 and 2.

The internal resistance of the Tell-tale lamps 3 is greater than the internal resistance of each of the turn signal lamps 1 and 2 and thus the lamps when functional form a partial by-pass of the respective tell-tale lamps 3. This reduces the amount of current flowing through the tell-tale lamps 3 to a value insufficient to illuminate them when the ignition is on but the turn signal switch inoperative. When however one or both of the turn signal lamps 1 and 2 associated with a given circuit 4 fails the partial by-pass of the tell-tale lamps 3 will be broken with the result that sufficient current will then flow through the corresponding resistance 5 and Tell-tale lamp 3 to illuminate it. It will be appreciated that the circuits 4 thus operate to warn of a turn signal lamp failure as soon as the ignition is switched on or the generating system begins to charge and before the turn signal switch 11A or flasher circuit 11B are used.

A similar circuit 12 for a trailer is also shown generally in figure 1 and consists of turn signal lamps 13 and a single Tell-tale lamp 14 to monitor the lamps 13 by virtue of a balance circuit 14A with resistances 15.

There may also be a separate flasher unit 16 for the trailer which is operable from the flashing pulse of the hauling vehicle flasher 11B.

Because the Tell-tale lamps will remain alight until the signal lamp fault has been rectified it is preferable to use resistances 5 and 15 that will light the Tell-tale lamps up to about 75% illumination. Therefore, when the failure of one of the signal lamps occurs, while the turn-signal switch is operated the Tell-tale lamp will flash from about 75% of its light intensity to full light intensity, thereby continuing to indicate that one of the turn signal lamps has failed.

As shown in the embodiment described where a hazard warning switch 16A is provided to simultaneously flash all turn-signal lamps on both sides of the vehicle, it may be advantageous to combine the resistors and diodes with the hazard switch into a single unit.

In other applications where only one turn-signal lamp is provided for each side of the vehicle, as, for example, in the case of trailers, one Tell-tale lamp 17 as shown in Figure 2 can be provided to indicate failure of the right-hand or left-hand turn-signal lamps 18. In this case the two signal lamps 18 are connected in series with respective resistors 19 to the ignition or generating system 20 of the hauling vehicle they do not light up however as the current is limited by the resistors

to a value insufficient to illuminate them. In this case the Tell-tale lamp 17 is connected across the two turn signal lamps 18 so that when they are both functional the terminals of the Tell-tale lamp 17 are at the same potential. If however, one of the signal lamps 18 fails, this equilibrium is destroyed and current will flow through the Tell-tale lamp 17 in series with the remaining signal lamp. Although this current is not sufficient to light up the turn-signal lamp it will suffice to operate the Tell-tale lamp 17, thus giving an indication that one of the signal lamps has failed.

When the trailer is disconnected at 19 the Tell-tale light 17 will not operate as it requires at least one trailer turn signal globe for the current to flow to earth.

The foregoing description deals with two examples of Tell-tale lamp arrangements which allow a permanent check on the conditions of the turn-signal lamps, before they need to be used. Thus remedial action can be taken to avoid accidents caused by turn-signal failure. It will also be appreciated that at least with the embodiments described conventional load sensitive flasher units are not required and lower cost electronic units where the flashing period is independent of load can be used that will serve as a combination hazard and turn signal unit.

The embodiments described are of course merely preferred ways of performing this invention and a wide variety of modifications obvious to a man skilled in the art may be made without departing from the scope of this invention. For example other equivalent circuits may be devised and the use of a lamp as a Tell-tale means is preferred only with other devices such as a buzzer also employable.

CLAIMS

1. A circuit for indicating a failure of one or more turn signal lamps of a vehicle, the circuit being connectible with the ignition or generating system of the vehicle and comprising a Tell-tale

means connected in a balanced electrical circuit with the turn signal lamps and a resistance means so that when the turn signal lamps are functional the Tell-tale means is inoperative and the relative resistances of the Tell-tale means and the turn signal lamps being such that failure of one of the turn signal lamps upsets the balance of the circuit to cause activation of the Tell-tale means when said circuit is connected to the ignition or generating system.

2. The circuit as claimed in claim 1 wherein the Tell-tale means, resistance means and one or more turn signal lamps are connected so that the one or more turn signal lamps when functional form at least a partial electrical by-pass of the Tell-tale means to render it inoperative but upon failure of one of the turn signal lamps sufficient current is caused to flow through the tell-tale means to activate it.

3. The circuit as claimed in claim 1 wherein the Tell-tale means is connected across two turn signal lamps so that when both of the lamps are functional there is no potential across the Tell-tale means and it is inoperative but upon failure of one of the lamps a sufficient current is caused to flow through the Tell-tale means to activate it.

4. The circuit as claimed in any one of claims 1 to 3 wherein the resistance of the Tell-tale means is greater than the resistance of the turn signal lamps.

5. The circuit as claimed in any one of claims 1 to 4 wherein the resistance means is chosen so that upon failure of one or more of the turn signal lamps the Tell-tale means is energized to about 75% of its capacity.

6. The circuit as claimed in any one of claims 1 to 5 wherein the Tell-tale means is a lamp.

7. A circuit for indicating a failure of one or more turn signal lamps of a vehicle substantially as described herein with reference to and as illustrated by Fig. 1 or Fig. 2 of the accompanying drawings.