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(54) Sound producing warning device for vehicle direction indicator system

(57) The warning device produces a sound which varies with time in order to give the driver a more noticeable warning that the direction indicator lights 3 or 4 are still flashing. A timing device 5 and an amplifier 6 may be provided so that after a certain adjustable time (T1, Fig.2) the volume of the warning sound produced by the amplifier 6 is increased. The volume is increased stepwise after further time intervals (T2) if the direction indicator is still operating, whereby the volume will rise above any ambient sound level. A gradual or stepped increase in frequency of the sound may alternatively be produced instead of increasing volume. If the flashers 1,2 use a bimetallic element, the ticking of that element may be picked up by a microphone connected to the amplifier 6. Alternatively, electronic flashers 1,2 can be hard wired to the amplifier 6 and a buzzer warning sound may be produced. The amplifier 6 may feed an existing car hi-fi speaker 7 nearest the driver, or a separate speaker may be used.

FIG.1

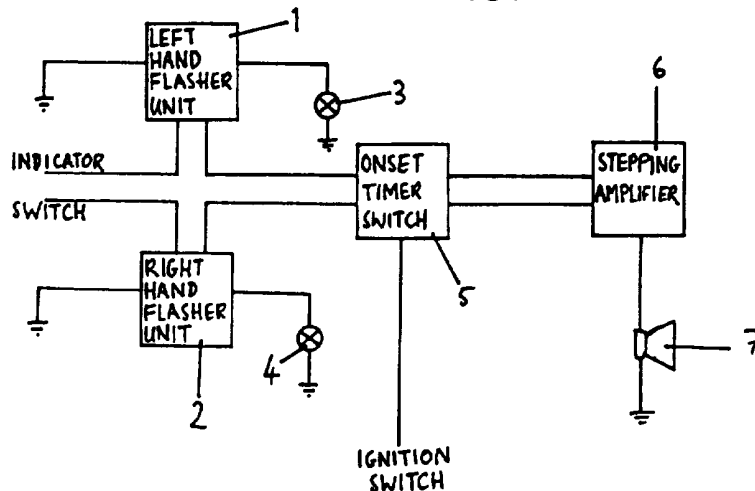


FIG. 1

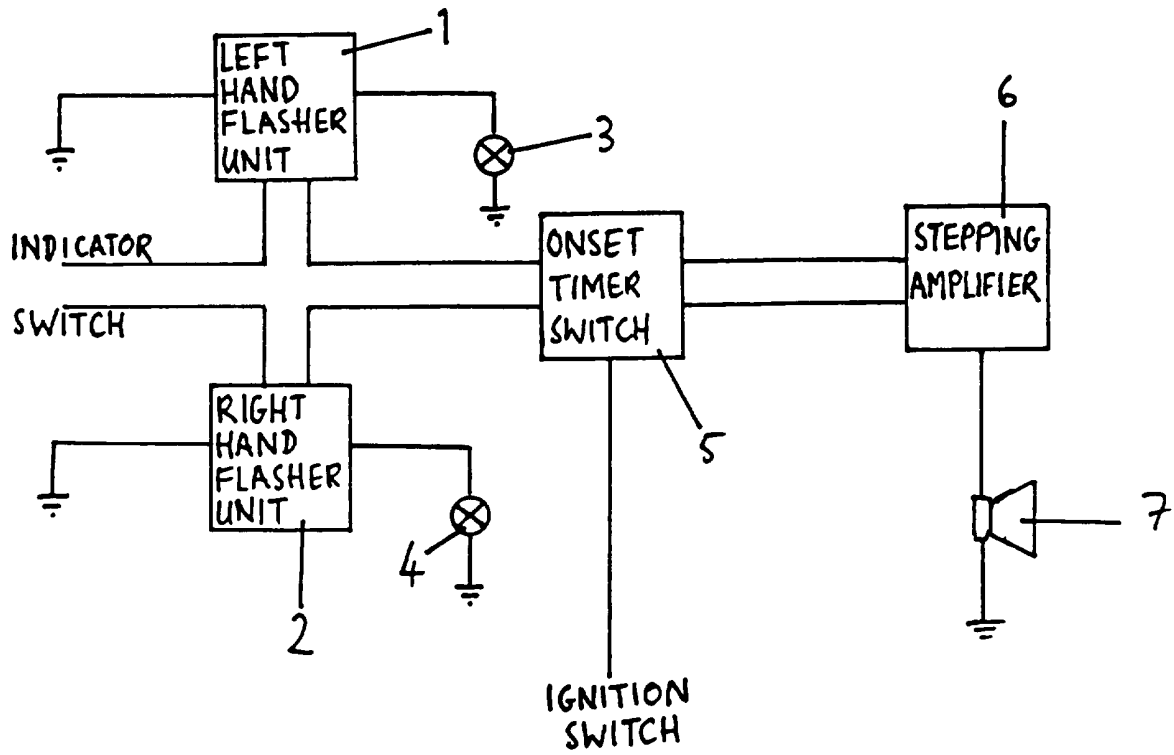
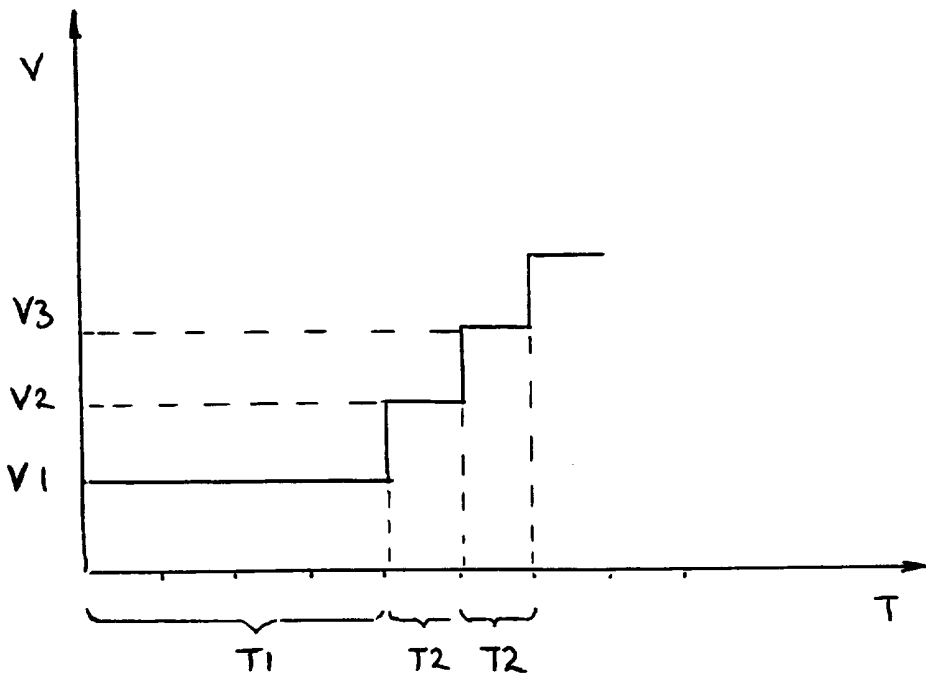


FIG. 2



VEHICLE DIRECTION INDICATOR WARNING DEVICE

This invention relates to a vehicle direction indicator warning device.

When a driver switches on either or both of his direction indicators, an audible "ticking" is usually produced in the cabin. However, the driver may cease to notice this sound, which may in any case be drowned by ambient noise. The direction indicators can thus be left on inadvertently, causing a considerable safety hazard.

It is an object of the invention to alleviate the above disadvantages of existing indicator warning devices.

The present invention consists in a vehicle direction indicator warning device comprising sound generation means which generates a variable sound in response to indicator operation.

Preferably, the variation in the sound generated comprises an increase in volume and/or frequency of the sound. Thus the sound becomes more noticeable to the driver.

In a preferred embodiment, timing means are provided for initiating a variation in the sound after a certain period of indicator operation. The timing means may be programmable to vary that period.

Means may be provided for varying the sound progressively so as to make the sound more noticeable in a continuous or stepped manner. Thus, when ambient noise is

present, the sound will always eventually rise above it.

The device may include compensating means which acts to control a characteristic of the generated sound in response to ambient noise level. For example, the volume of the sound can be held above that of the ambient noise.

An embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:

FIG. 1 shows a schematic block circuit diagram of a vehicle indicator warning device according to the invention; and

FIG. 2 shows a graph of volume against time for the indicator device shown in Fig. 1.

As shown in Fig. 1, flasher units 1,2 are provided for the left and right direction indicators respectively. The flasher units are controlled by conventional indicator switches to operate left and right vehicle indicator lighting circuits 3,4 respectively.

As soon as either of the flasher units 1,2 is actuated, an output therefrom initiates an onset timer switch 5. The onset timer 5 is only powered up when the car's ignition switch is on, and once initiated, the onset timer measures a predetermined delay period  $T_1$  (see Fig. 2) after which it actuates a stepping amplifier 6. The amplifier increases the volume of the "ticking" sound through a speaker 7 in the cabin of the vehicle from volume  $V_1$  to  $V_2$ .

The onset timer 5 is controlled by an on/off dashboard switch which can be switched to one of several positions so that the amplifier 6 is brought into use after different delay periods (T1), for example: 5,10,15,20,25 or 30 seconds.

If the flasher unit 1 or 2 is not switched off after a further delay period T2 which is preset when the device is manufactured, and may be equal to 5 seconds for example, then the timer 5 will cause the amplifier 6 to raise the volume still further to the level V3. At the end of each subsequent further delay period T2 during which the indicator is not cancelled, the indicator sound volume will rise again and the indicator sound volume will accordingly rise in stages every five seconds for example until it is clearly audible above any other noise.

It will thus be apparent that the present invention will help to prevent vehicle indicators being left on inadvertently, since the sound level will eventually be raised above noise from the engine, road, wind, radio, cassette or CD player or passenger noise. The invention will be useful when direction indicators are used in urban driving, necessitating full turns of the steering wheel, and when changing lanes on major roads involving small movements of the steering wheel which will not affect automatic cancellation of indicator operation. The indicator warning device can be fitted to cars, lorries, coaches and buses and will enhance safety for the vehicle having the device

and for surrounding vehicles.

Modifications can be made to the particular embodiment of the invention which has been described. For example, the speaker 7 can be the existing driver's side front speaker in a car stereo system. A circuit can be provided which automatically raises the indicator warning sound above the ambient noise level, as is known in the art of car hi-fi systems.

If the flasher units 1,2 are of the bimetallic strip type, a microphone can be provided near to the bimetallic strip so that the amplifier 6 increases the "ticking" sound. Alternatively, if the flasher units 1,2 are entirely electronic, they can be hard wired to the amplifier 6. The sound generated need not be a "ticking" and could be a buzzer or other sound.

The amplifier 6 could be replaced by a frequency multiplier which gradually increases the frequency of the sound continuously or in stages.

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**CLAIMS :**

1. It is a device that increases the volume of the sound, or a substituted sound, of the vehicle indicator warning signal.
2. A device as claimed in Claim 1 where the volume of this sound will rise in steps to be increasingly audible above any other noise.
3. A device as claimed in any preceding claim where the resulting sound can be heard through the device's own speaker, or through existing car hi-fi speaker, nearest the driver.
4. A device as claimed in any preceding claim where the device can be set by the user to determine the time interval before the cycle described in Claim 1 begins.
5. A device as claimed in any preceding claim where the device can be set by the user to determine the time interval between the volume increases once the cycle described in preceding claims has begun.
6. A device as claimed in any preceding claim where the device will only operate with the vehicle ignition circuit turned on.
7. A device as claimed in any preceding claim where the device will not operate when the four emergency hazard warning lights are operating.

