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(54) **Device for automatic switching-on of a vehicle headlamps**

(57) The subject of the invention is an electronic circuit to be retrofitted in the vehicle's traditional headlamp circuit and which is capable of automatically switching

on the headlamps when the engine is started, after a suitable delay, thereby ensuring compliance with current road regulations requiring the use of daytime running lights.

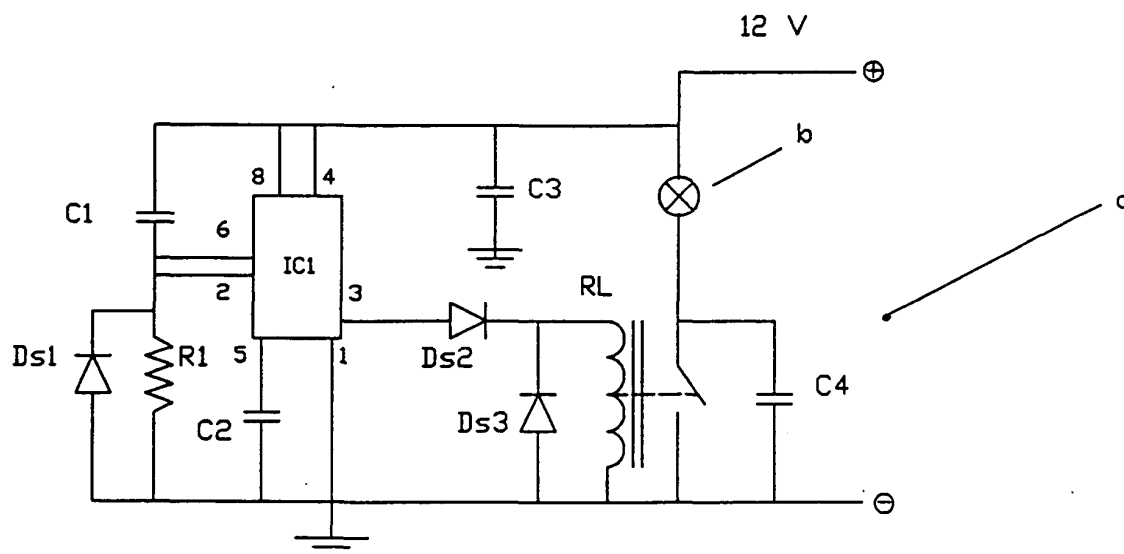


Fig 1

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Description

[0001] This industrial invention refers to an electronic device to be retrofitted in the traditional electric circuit of cars, motorcycles or other vehicles and which is capable of automatically switching on the headlamps when the engine is started, thereby ensuring compliance with current road regulations requiring vehicle users to drive with their lights on even in the daytime.

[0002] With specific reference to the electrical systems currently installed in different vehicles, we may affirm that manufacturers adopt two types: with the first, defined as "key operated", the headlamps can be switched on and off only if the key is turned in the ignition; with the second type, "non-key operated", the headlamps are activated independently by means of a switch.

[0003] Users who wish to avoid being fined during the daytime - if the system in their car is of this latter type - must thus remember to switch on the headlamps after starting the engine. Moreover, they have to switch off the lights when they turn off the engine.

[0004] In key operated circuits the headlamps switch off automatically, but not on, as the current of the battery would not be completely available for starting the engine.

[0005] The principal aim of this invention is to eliminate said limitations by means of a device, retrofittable in either type of circuit, which automatically switches on the headlamps when the engine is started, allowing a fixed amount of time to elapse first so as not to divert the current necessary for ignition, and then turns them off without there being any need to operate a switch. Thus the user is freed of every task.

[0006] These and other features will now be further clarified in relation to a simple design configuration of the invention. The description herein serves purely illustrative purposes and in no way restricts the scope of this patent.

[0007] Reference is made to the annexed drawings, in which:

Fig.1.

shows the electronic circuit to which the claims pertain.

Fig.2.

shows a variant of the previous circuit.

[0008] In these figures, -a- indicates the car battery, -b- the headlamp bulb, R a series of resistors specified in the table, C a series of capacitors, D a series of diodes, IC1 an integrated circuit, RL a relay and TR1 a transistor.

[0009] In one possible configuration, the recommended values of the components are as follows:

R1 56000Ω ¼ W
R2 8200Ω ¼ W

R3 47000Ω ¼ W
C1 100μF 16VI electrolytic
C2 10000pF 160VI polyester
C3 100μF 16VI electrolytic
5 C4 10000pF 160VI polyester
Ds1 1 N4150 diode
Ds2 1 N4007 diode
Ds3 1 N4007 diode
IC1 NE555 integrated circuit
10 RL 12V relay =, 80mA, 1 contact
TR1 Transistor NPN

[0010] When the circuit is retrofitted in a traditional electrical system, in this specific case the key operated type with the "light switch on", it works in the following manner: when the ignition key is turned, the integrated circuit (IC1) is energized at pins 4 (Reset) and 8 (Vdc) at a voltage between 5 and 15 Volts, levelled by the electrolytic capacitor (C3).

15 **[0011]** The capacitor (C1) and resistor (R1) give the time constant that determines the desired delay in the illumination of the headlamps.

[0012] When the voltage at pins 2 (Trigger) and 6 (Threshold) changes, output 3 switches over from the low to the high value of the supply voltage. As a result the relay (RL) connected to it is energized and closes the contacts (thereby activating the headlamps).

25 **[0013]** This situation remains unchanged until the power to the circuit is cut off.

30 **[0014]** When the circuit is de-energized, a diode (Ds1) immediately discharges a capacitor (C1) to prepare the circuit to repeat the cycle.

[0015] The pin indicated by the number 5 (Voltage control) is not used and is earthed via a capacitor (C2).

35 **[0016]** Pin 7, not indicated, is left open.

[0017] A second diode (Ds2) serves to protect the integrated circuit (IC1).

[0018] A third diode (Ds3) serves to damp the voltage peaks generated in the coil of the relay (RL) which acts like an inductor when power is cut off.

40 **[0019]** A capacitor (C4) serves to limit the sparking of the relay contacts (RL).

[0020] Fig. 2 shows a power transistor (TR1) - installed in place of the relay (RL) and performing the same functions — with the polarization network formed by (R2) and (R3).

45 **[0021]** In practice, the specific configuration, dimensions, materials, shape and other details of the invention may vary while remaining within the sphere of protection of this industrial patent. In fact, the invention thus conceived lends itself to numerous adaptations and variants, all falling within the scope of the inventive concept. In addition, all the elements may be replaced with other technically equivalent ones.

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Claims

1. **AUTOMATIC VEHICLE HEADLAMP ILLUMINATION DEVICE** consisting in an electronic circuit to be retrofitted in the pre-existing electrical circuit of the vehicle and which includes, in its preferred configuration, the following components:

R1	56000Ω ¼ W	
R2	8200Ω ¼ W	10
R3	47000Ω ¼ W	
C1	100μF 16VI electrolytic	
C2	10000pF 160VI polyester	
C3	100μF 16VI electrolytic	
C4	10000pF 160VI polyester	15
Ds1	1 N4150 diode	
Ds2	1 N4007 diode	
Ds3	1 N4007 diode	
IC1	NE555 integrated circuit	
RL	12V relay = 80mA.	20

Characterised by the fact of being designed to switch on the headlamps (b), after a timed delay, when the ignition key is turned, according to an operating scheme whereby the integrated circuit (IC1) is energized at pins 4 (Reset) and 8 (Vdc) at a voltage between 5 and 15 Volts, levelled by an electrolytic capacitor (C3).

Successively, when the voltage at pins (2) (Trigger) and (6) (Threshold) changes, the output (3) switches over from the low to the high value of the supply voltage, causing the relay (RL) connected to it to become energized and close the contacts (thereby activating the headlamps).

Further **characterised by** the fact that the whole system is designed to switch on the headlamps (b) after a suitable delay, according to an operating scheme that provides for a capacitor (C1) and resistor (R1) to give the time constant.

2. **AUTOMATIC VEHICLE HEADLAMP ILLUMINATION DEVICE**

as described in the main claim, **characterised by** the fact that, in a second version of the circuit, the relay (RL) can be replaced by a power transistor (TR1, NPN) with polarization network formed by (R2) and (R3), which performs the same function.

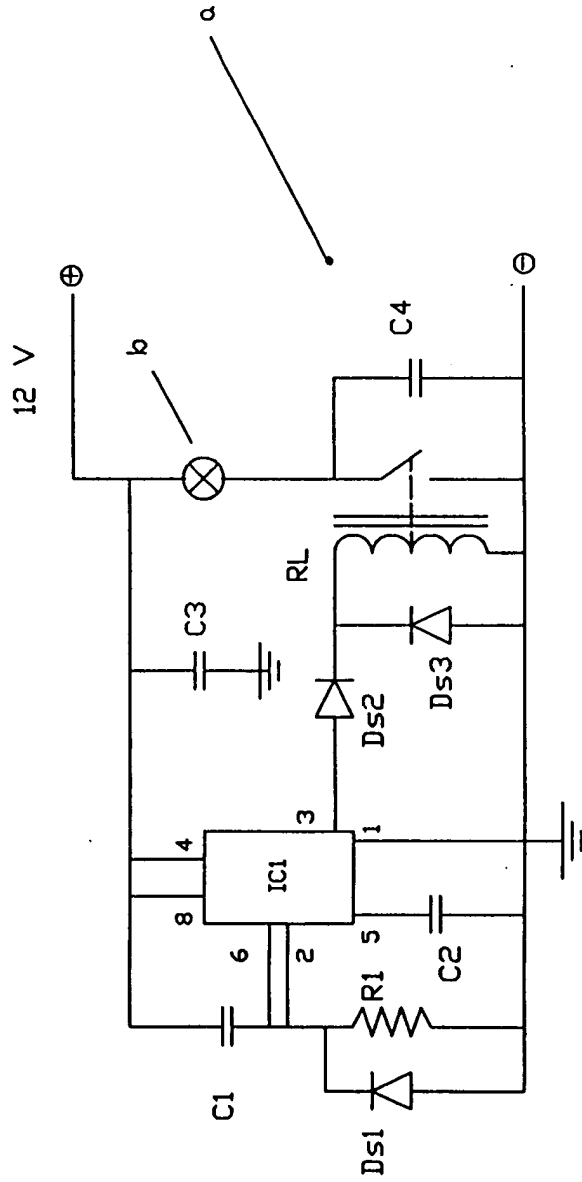


Fig 1

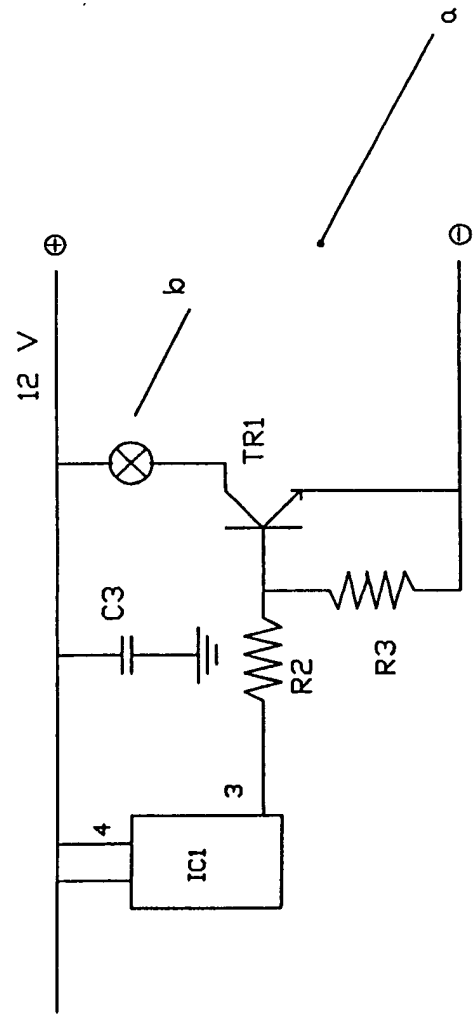


Fig 2