

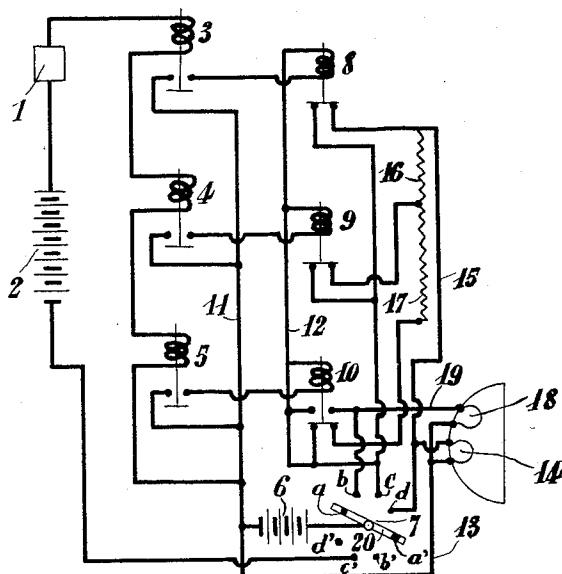
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DEVICE FOR AUTOMATICALLY DIMMING THE LIGHTS OF AUTOMOBILES

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DEVICE FOR AUTOMATICALLY DIMMING THE LIGHTS OF AUTOMOBILES

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The present invention relates to a device for varying the light of the head-lights of a motor vehicle, said device automatically dimming the light when the car passes another oncoming lighted vehicle, and then re-establishing it. To this end, a selenium cell (the electrical resistance of which varies considerably when it is illuminated) is placed on the car, and advantage is taken of the variations of current, in an electric circuit comprising the cell, the source of current and receiving apparatus, which occur on passing an on-coming lighted vehicle, to control the head-lights of the motor vehicle automatically and in any desired manner, by means of said receivers, and other suitable devices controlled by the receivers.

The receivers may be constituted by electromagnets, by relays controlling more powerful electromagnets, by electromagnetic or electro-dynamic apparatus, the moving part of which deviates more or less according to the value of the current, or by current amplifiers. In the latter case, the amplifiers act on indirect receivers similar to the direct receivers mentioned above.

The controlling device actuated by the receivers may be ordinary or liquid rheostats, switches or circuit breakers, or even mechanical devices such as devices for tilting the headlights.

Other characteristics and features of the invention will become apparent from the ensuing description taken in conjunction with the accompanying diagram. In the example described, it has been assumed that the headlights comprise a powerful lamp and a dim lamp, and that there are four degrees of illumination; full lighting, two resistances introduced in succession in the circuit of the powerful lamp and dim lighting.

The sensitive selenium cell 1 is mounted in a circuit comprising a battery of primary cells 2, three relays 3, 4 and 5, the usual set of accumulators 6 of the vehicle, and a switch 7, the purpose of which will be presently described, the battery 2 being connected to the stud *c'* of the switch 7.

The relays 3, 4 and 5, when excited by a current which must be greater for the relay

4 than for the relay 3, and for the relay 5 than for the relay 4, close the exciter circuits of the more powerful relays 8, 9 and 10. These circuits are mounted in parallel on two conductors 11 and 12 fed by the battery, 6, one directly, and the other, ending at the stud *c* of the switch 7, through the medium of said switch.

The variable circuit of the head-light includes the battery 6, the conductor 13, the lamp of the head-light 14, the conductor 15, the resistances 16 and 17 brought into circuit one after the other by successive opening of the relays 8 and 9, the lower contacts of the relay 10, and the stud *c* of the switch 7. The dim lamp 18 is likewise mounted between the conductor 13 and the stud *c* through the medium of the upper contacts of the relay 10 and of the conductor 19;

The installation likewise includes fixed circuits for the powerful lamp and the dim lamp, said circuits comprising the battery 6, the conductors 13 and, respectively, the studs *d* and *b* of the switch 7 connected to the return wires 15 and 19 of the powerful lamp and of the dim lamp and allowing the latter to be connected to the battery without passing through the contacts of the relays 8, 9 or 10.

The studs, *a a'*, *b b'* and *d d'* of the switch 7 are neutral studs. This switch includes a rotatable arm 20 actuated manually by the driver of the vehicle and enabling the battery 6 to be cut out of circuit (position shown in the drawing) or to be connected to the conductors finishing at the studs *b c* and *c' d*.

When the arm 20 bridges the studs *a, a'*, a pole of each of the batteries 2 and 6 is cut out of circuit, and no current can flow through the apparatus illustrated in the diagram; naturally, the batteries, and, in particular, the battery of accumulators 6, may remain connected to other apparatus with which the invention is not concerned, such as lamps other than those of the head-lights and the self-starter.

When the arm 20 bridges the studs *b, b'*, the circuit comprising the battery 6, the conductor 13, the dim lamp 18, the conductor 19

and the stud *b* is closed, and the dim lamp is lighted. The battery 2 remains on open circuit, and consequently this position of the switch 7 corresponds to the fixed dim lighting.

The position of the arm bridging the studs *c*, *c'* is that which brings the selenium cell into action. The circuit comprising the battery 6, the relays, 5, 4 and 3, the cell 1, the battery 2 and the stud *c'*, is then closed and there flows through it a current which is all the more powerful as the cell is more brightly illuminated. The battery 2, which is weak, is mounted in this circuit in series with the battery 6 which is generally a low voltage battery. Its object is simply to cause a stronger current to flow in the circuit of the cell, whereby relays 3, 4 and 5 of less costly construction may be used or the switches, which, in the drawing, are controlled by the electro-magnets on the relays 8, 9 and 10, may even be controlled directly with electromagnets mounted in the circuit of the selenium cell.

The conductors 11 and 12 are both connected to the battery 6, but the current does not flow through the relays 8, 9 or 10 so long as the corresponding relays 3, 4 or 5 have not closed the contacts they control. Hence the lower contacts of the relays 8, 9 and 10 are normally closed. The circuit comprising the battery 6, the conductor 13 and the head-lamp 14, the conductor 15, the contacts of the relay 8 and the stud *c* is made, and the head-lights supply full illumination. When a vehicle with its lights on approaches the vehicle fitted with the device described, the resistance of the cell 1 decreases, the current in its circuit increases, and the first relay 3 closes and excites the relay 8 and opens its contacts. The current then flows into the lamp 14 through the conductor 15, the resistance 16 and the contacts of the relay 9, and the head-light gives out a weaker light. With the current flowing through the cell 1 further increasing, the relay 4, closes in its turn and excites the relay 9, the contacts of which open. The lamp 14, which then receives the current through the conductor 15; the resistance 16 and 17 and the lower contacts of the relay 10, gives a still weaker light. When, finally, with the resistance of the cell 1 still decreasing, the relay 5 closes and excites the relay 10, the lower contacts of the latter open and put out the lamp 14, while its upper contacts close and, connecting the conductor 19 to the stud *c*, light the dim lamp 18.

With the arm 20 then bridging the studs *d*, *d'*, a fixed circuit comprising the battery 6 and the lamp 14 is made and the head-light gives its full power, independently of the automatic device for varying the illumination. The circuit of the cell 1 is again broken.

It is obvious that the device described is

only an example of the application of the invention to a particular case. A continuous variation of the light of the head-lights may give better results than a graduated variation when two vehicles having a variable illumination pass each other, and such variation may be obtained for example by means of an electromagnet, the armature of which is progressively displaced as the exciting current increases, and acts on the sliding contact of a rheostat. Moreover, the number of gradations of light variations may be changed, and such gradations may be obtained in several ways, either, for example, by inserting resistances in the circuit of the head-light, or by lighting lamps of different powers, or again by tilting the head-light in order to direct its illuminating beam downwardly.

The various controlling apparatus which come into action to decrease the lighting of the vehicle, when the intensity of the current reaches a certain value in the circuit of the selenium cell, may be so actuated that they only return to their original position when the current returns to a lower value than the preceding one, for example to the value which corresponds to the non-lighting of the cell by a vehicle passing in the opposite direction. This arrangement decreases the light fluctuations which may be produced when two vehicles fitted with the device according to the invention pass each other.

The cell may be protected from luminous rays other than those of the vehicles encountered (street lamps, moon etc.) by means of a screen or vizor.

I claim:

In a device for controlling the lights of a vehicle, when meeting an oncoming lighted vehicle, the combination with said lights, which include a main light and a dim light, of an electric circuit including a source of current, a selenium cell included in said circuit for varying the resistance thereof, a second source of current for lighting said main and dim lights, manually operated means for making and breaking the circuits of said main and dim lights separately, and the circuit of said selenium cell simultaneously with that of said main light, a resistance comprising a plurality of sections adapted to be brought into the circuit of said main light, a plurality of electromagnetic means for successively introducing said resistance sections into said main light circuit and subsequently opening said main light circuit and closing the dim light circuit, and a plurality of relays responsive respectively to progressive increases of current produced by progressive decreases of resistance of said selenium cell for selectively operating said electromagnetic means.

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