Oct. 11, 1932. J. GSTYR ET AL 1,881,521

AUTOMATIC DIMMING DEVICE

Filed Aug. 28, 1928

FIG. 2

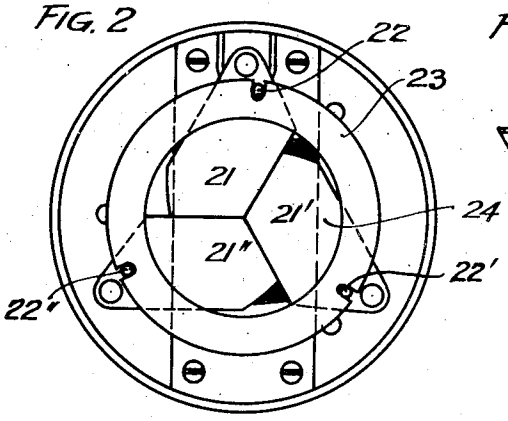


FIG. 1

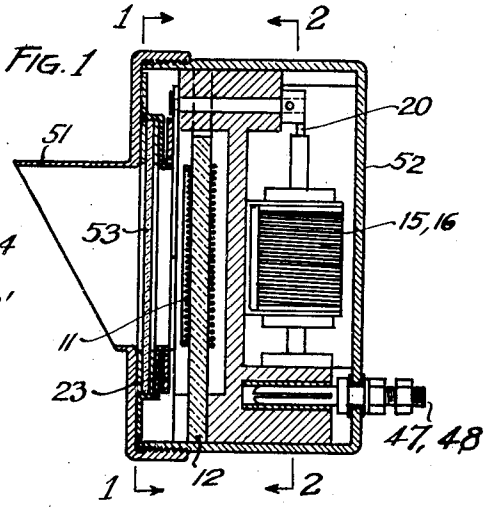


FIG. 3

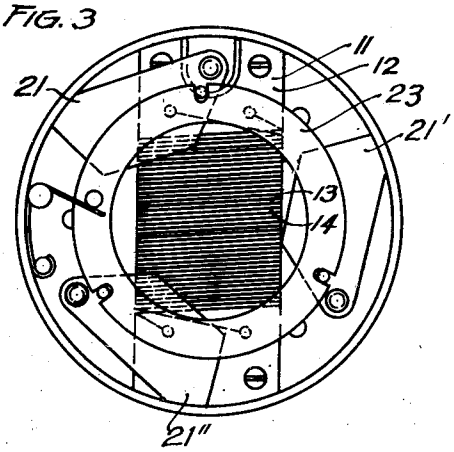


FIG. 4

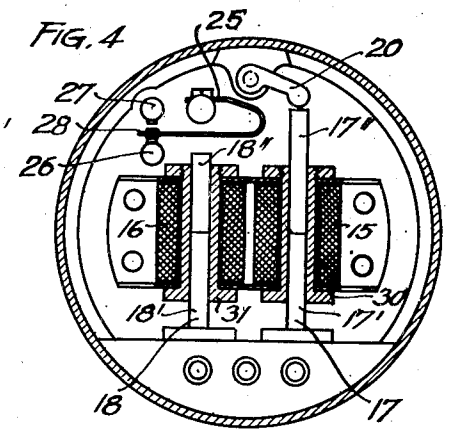


FIG. 5

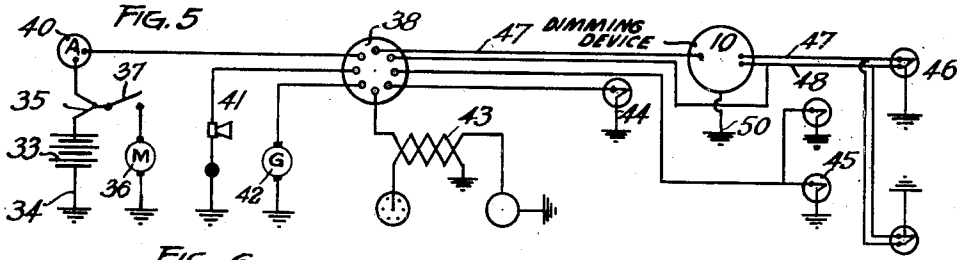
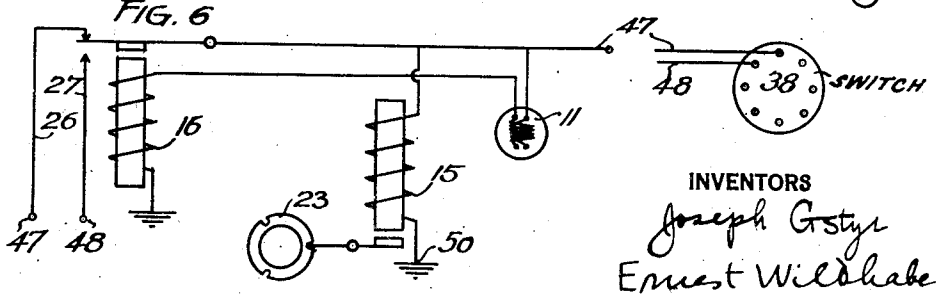


FIG. 6



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Patented Oct. 11, 1932 1,881,521

UNITED STATES PATENT OFFICE

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AUTOMATIC DIMMING DEVICE

Application filed August 28, 1928. Serial No. 302,522.

The present invention relates to an automatic dimming device for automotive vehicles, such as automobiles and trucks.

Hitherto it was required to dim the lights of a car every time another car was met on a highway. This operation of dimming is necessitated to prevent glaring and blinding the driver of the other car.

The present invention has for its object to automatically provide safe dimming operation and to thereby relieve the driver of a tiresome task. Further objects will appear in the course of the specification and from recital of the appended claims.

The invention will be explained with reference to accompanying drawing, which illustrates one of its embodiments, and in which Fig. 1 is a section through a dimming device according to the present invention.

Fig. 2 and Fig. 3 are front views along lines 1—1 of Fig. 1, with cap 51 removed. Fig. 2 and Fig. 3 illustrate two different positions of the mechanism.

Fig. 4 is a section along lines 2—2 of Fig. 1.

Fig. 5 is a diagram illustrative of an electric system of a car containing an automotive dimming device as provided by the present invention.

Fig. 6 is a diagram illustrative in detail of element 10 shown in Fig. 5.

The present invention makes use of a light sensitive element for registering the proximity of a car which approaches from the front. Two cars approaching each other from the front with head lights burning will of necessity throw light upon each other. In accordance with the present invention a light sensitive element is disposed in a manner to receive some of said projected light, and is made to operate a dimming switch as will be presently explained.

In the Figures 1 to 4 the numeral 11 denotes a light sensitive element or cell, which may be made of any suitable character and material.

If made of selenium or of a similar material, two electrodes in the form of wires or plates are disposed closely adjacent each other, and in accordance with known practice are preferably wound on an insulator 12 in such manner that adjacent turns 13, 14 form part of two opposite electrodes, and that alternate turns form part of the same electrode. The light sensitive substance is disposed between the two electrodes and forms a bridge from one electrode to the other. When light falls on cell 11, it reduces its electric resistance, so that increased electric current passes between the electrodes, when they are maintained under constant voltage.

Two coils 15, 16 having movable cores 17, 18 form two electromagnets. The cores 17, 18 consist of iron or steel on one side, namely on sides 17′, 18′, whereas the other sides 17″, 18″ consist of a nonmagnetic metal, in order to increase the eccentricity of the iron core and to accentuate the force with which it may be pulled into the corresponding coil. Core 17 cooperates with a lever 20, which is rigidly secured to a shutter leaf 21. The latter contains a projecting pin 22 engaging a slot of a ring shaped member 23. Said member is angularly moved on its center through pin 22, whenever lever 20 is swung on its axis.

Member 23 contains further slots, which cooperate with pins 22′, 22″ of other leaves 21′. 21″, in such manner that all the leaves 21, 21′, 21″ assume corresponding positions. Said leaves constitute a shutter 24, which is shown in closed position in Fig. 2 and in an opened position in Fig. 3, and which serves to protect the light sensitive element or cell from excessive and unnecessary rays of light.

In particular shutter 24 provides a protection of cell 11 from intense day light, and prevents early deterioration of said cell through continuous exposure to day light, which is often much stronger than the light for which the cell is built to react upon.

Core 18 is operatively connected with a dimming switch, which consists of a spring 25 electrically connected with one electrode of a battery, and of two contacts 26, 27, with which a portion 28 of spring 25 may alternately effect contact. In the position indicated in Fig. 4, spring 25 forms an electric connection with contact 26, which keeps the head lights of the car burning at full strength, as will be more fully described hereafter. When

however core 18 is moved upwardly, referring to Fig. 4, it engages spring 25 and moves it upwardly, so that it severs connection with contact 26 and establishes an electric connection with contact 27, to dim the head lights. Cores 17, 18 are guided by sleeves 30, 31 which are concentric with coils 15, 16. When little or no current flows through coils 15, 16, the corresponding cores 17, 18 are in the positions indicated in Fig. 4. They are maintained in these positions through the action of gravity, or through suitable springs, or through both gravity and springs. When electric current flows in full strength through coil 15 or through coil 16, the core 17 or core 18 respectively is moved upwardly (Fig. 4) to positions already described, and maintained in such positions as long as current flows at full strength through the corresponding coils.

The arrangement of an automatic dimming device in an electric system of an automobile will now be described with reference to Fig. 5. In this figure the dimming device is denoted with the numeral 10. Except for this dimming device and its connection with the electric system, all other parts shown are known and correspond to established practice.

33 is a battery whose one pole 34 is connected with the frame of the car, which connection is commonly called grounded and is correspondingly indicated in the drawing. Pole 35 of battery 33 may be connected with a starting motor 36 by means of a starting switch 37. Pole 35 is further connected with a general switch 38 by suitable wires containing an ammeter 40. Switch 38 selectively connects battery 33 with a horn 41, with a generator 42, with ignition device 43, with a rear light 44, with parking lights 45 and with head lights 46. Connection with head lights may be made either through wire 47 or through wire 48. The former wire leads through dimming device 10 and supplies energy to keep the head lights burning at full strength, unless the light is automatically dimmed by device 10. The latter wire (48) forms another electric connection with the head lights and serves for dimming the head lights by hand. The known elements enumerated are shown in the drawing in a manner customary in the art.

Dimming device 10 is further illustrated in Fig. 6, which is a purely schematic diagram. The same numerals are used as in the Figures 1 to 4 to designate the same parts. The operation is as follows:

When switch 38 is set to connect battery 33 with wire 47, current at first flows through contact 26, see Fig. 6, and maintains the head lights 46 burning at full strength. Current also flows through coil 15, which is connected with the frame of the vehicle on one side, as indicated at 50 with the customary symbol of ground connection. The magnetic force created by the current in coil 15 turns ring member 23 and thereby opens the shutter leaves 21, which protect cell 11 as long as the head lights are left dark. When rays of sufficient intensity strike cell 11, said cell reduces its electric resistance, so that then sufficient current flows through it and through coil 16 to disrupt connection with contact 26 and to establish connection with contact 27, which corresponds to dimmed lights. Again when outside light ceases to strike cell 11, its electric resistance increases and reduces the current in coil 16. Connection with contact 26 is then reestablished, and the head lights again burn at full strength.

It is noted that the driver is completely relieved of the tiresome operation of dimming the lights whenever a car approaches from the front, and thereby throws some light on cell 11. Also when driving in towns and villages the street lights influence cell 11 and thereby automatically dim the lights of the car, as also required by law.

Cell 11 may be protected from undue top light and undue side light by suitably shaping cap 51. Cell 11 then reacts especially to front light. Preferably the cell is completely enclosed, namely by casing 52 and by front glass 53. If so desired, enclosure may be made air tight, to further protect the light sensitive cell.

It is clearly understood that the invention is not confined to the use of any particular light sensitive cell nor to any particular wiring combination.

It is capable of many modifications without departing from its spirit, by simply applying the established practice and customary knowledge of the art. For definition of its scope we rely on the appended claims.

What we claim is:

1. An automatic dimming device for car lights, comprising a light sensitive element disposed to receive front light, a shutter for protecting said element, means for opening said shutter, said means being operatively connected with said car lights, means for dimming said car lights, and an operative connection between said elements and said dimming means.

2. An automatic dimming device for car lights, comprising a fully enclosed light sensitive element, a shutter for protecting said element, means for automatically opening said shutter when the car lights are switched on, means for dimming the car lights, means for maintaining said light sensitive element under voltage, and an electro-magnet controlled by the electric current passing through said element, for operating said dimming means.

3. An automatic dimming device for car lights, comprising a light sensitive element, a shutter for protecting said element, an elec-

tro-magnet for opening said shutter when said car lights are switched on, means for dimming the car lights, means for maintaining said light sensitive element under voltage, and an operative connection between said light sensitive element and said dimming means.

4. In a car, an electric battery for feeding car lights, means for switching on said car lights, means for dimming said car lights by hand, a light sensitive element disposed to receive front light, means for maintaining said element under voltage only when said lights are switched on, and an operative connection between said light sensitive element and said dimming means.

5. In a car, an electric battery for feeding car lights, means for switching on said car lights, means for dimming said car lights, a light sensitive element disposed to receive front light, said element being connected in parallel with said car lights in a manner to be maintained under voltage only when said lights are switched on, an electro-magnet fed by the electric current passing through said element, and an operative connection between said magnet and said dimming means.

6. In a car, an electric battery for feeding car lights, a light sensitive element disposed to receive front light, said element being connected in parallel with said car lights, a shutter for protecting said element, an electro-magnet connected with said car lights for operating said shutter, means for dimming the car lights, and another electro-magnet connected with said element for actuating said dimming means.

7. In a car, an electric battery for feeding car lights, means for dimming said car lights, a light sensitive element disposed to receive front light, said element being connected in parallel with said car lights, an electro-magnet for actuating said dimming means, an operative connection between said electro-magnet and said light sensitive element, a shutter for protecting said light sensitive element, a switch for controlling said car lights, and means for automatically opening and closing said shutter when the car lights are switched on and off respectively.

8. In a car, an electric battery for feeding car lights, a light sensitive element disposed to receive front light, said element being connected in parallel with said car lights, means for dimming said car lights, an operative connection between said light sensitive element and said dimming means so that operation of said dimming means depends on the electric current passing through said light sensitive element, a shutter for protecting said light sensitive element, a switch for controlling said car lights, and means for automatically opening and closing said shutter when the car lights are switched on and off respectively.

9. In a car, an electric battery for feeding car lights, a light sensitive element disposed to receive front light, means for dimming said car lights, an operative connection between said light sensitive element said battery and said dimming means so that operation of said dimming means depends on the electric current passing through said light sensitive element, a switch for controlling said car lights, and means for automatically opening and closing said shutter when the car lights are switched on and off respectively.

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