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AUTOMATIC INDICATOR FOR ELECTRIC CIRCUITS

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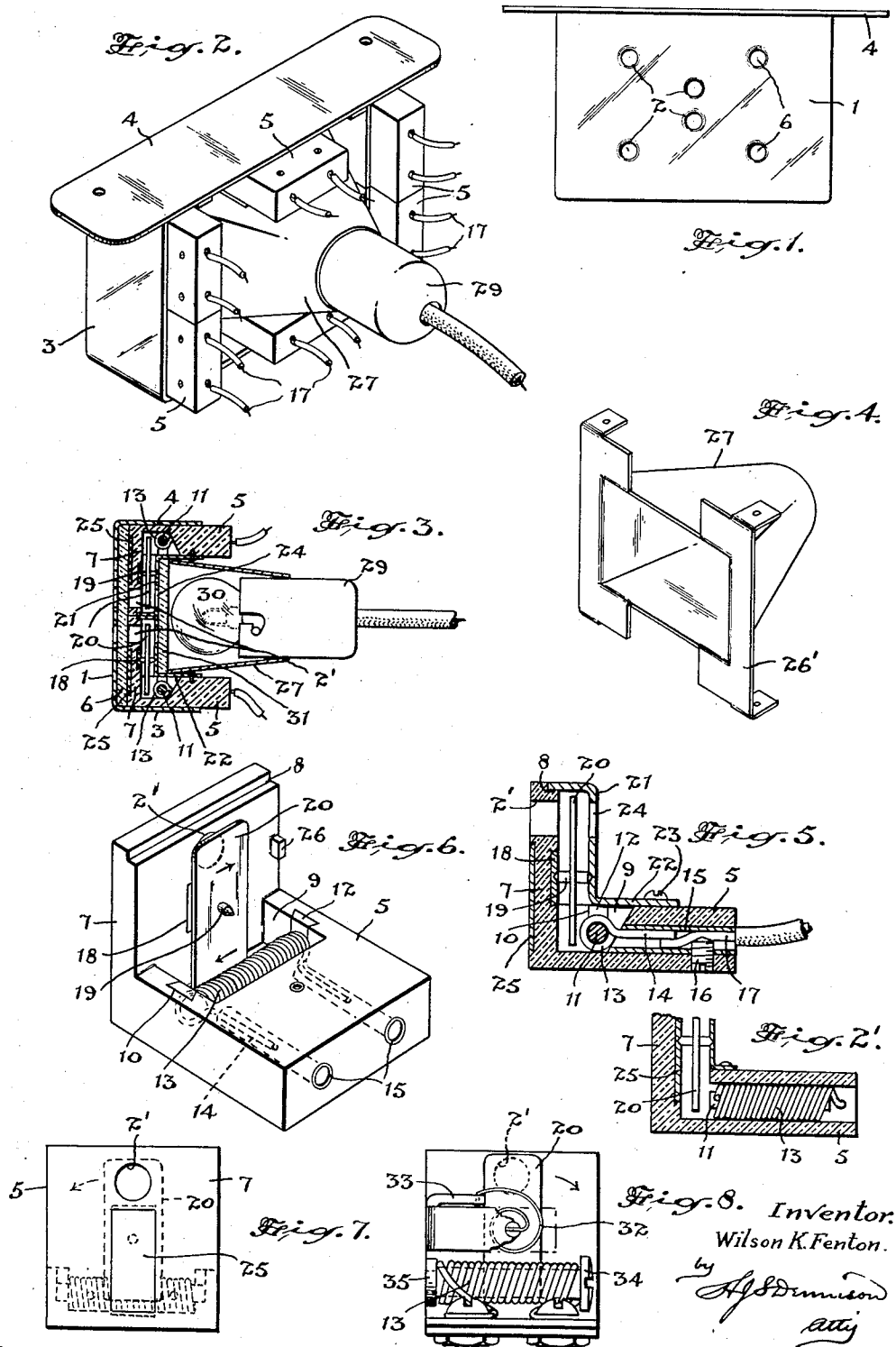


Fig. 8. Inventor.
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AUTOMATIC INDICATOR FOR ELECTRIC CIRCUITS

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5 Claims. (Cl. 177—311)

The principal objects of this invention are to provide a dependable means for indicating whether or not an electric circuit is in operable condition, and to devise a very compact and simple form of device which may be readily assembled in grouped arrangement to indicate the condition of a plurality of circuits such as the lighting circuits in a motor car.

The principal features of the invention consist in the novel construction and arrangement of a pivotal member adapted to intercept a beam of light projected through an orifice and in the novel construction and arrangement of magnetic means for operating said pivotal member whereby by the whole structure is assembled in a compact individual unit.

A further and important feature of the invention consists in the novel construction of the indicating unit whereby a plurality of said units are assembled within a retaining casing about a common source of light to provide the indicator light beams.

In the drawing Figure 1 is an elevational view of the face plate of a multiple unit indicator, particularly adapted for motor car use.

Figure 2 is a perspective view taken from the back of an assembled indicator structure.

Figure 2' is a sectional detail showing an arrangement of magnet and shutter.

Figure 3 is a vertical mid-sectional view through the assembled device taken through the central lighting element.

Figure 4 is a perspective detail of the light enclosing shield.

Figure 5 is an enlarged vertical mid-sectional view through one of the individual indicator elements.

Figure 6 is an enlarged perspective detail of one of the individual indicator elements with the back plate removed.

Figure 7 is a face view of the front of one of the individual indicator elements.

Figure 8 is an elevational view showing a slightly modified construction of the means for operating the pivotal "shutter" member.

It is a very well known fact that the operation of motor vehicles on the highways after dark is rendered extremely dangerous to life and property through failure to maintain proper lights upon the vehicles and it is very desirable that the operator of the vehicle should be aware at all times of the condition of his lights. This applies not only to head lamps but to side and tail lamps.

The present invention has been devised to pro-

vide a centralized indicator which will be constantly visible to the driver and will indicate to him the condition of the various lights upon his car.

In the device herein shown a face plate 1 is arranged upon the dash board of the vehicle or may be placed in any other convenient position so that it may be always visible to the driver and in this face plate are arranged a plurality of small orifices 2.

The face plate as here shown forms the front of a small rectangular casing 3 which is open at the back and is provided with a fastening plate 4 on the top side.

Within the casing 3 are grouped a plurality of indicating units 5. These preferably fit behind a ground glass plate 6 arranged at the back of the face plate 1.

The units 5 are herein shown constructed of an L-shaped block of insulating material preferably moulded to form and the upright leg 7 thereof is provided with small circular orifices 2', which when the blocks are assembled in the casing register with a corresponding orifice 2 in the face plate.

A longitudinal groove 8 is formed in the upper edge of the inner side of the upright portion 7 of the block and a substantially rectangular recess 9 is formed in the top side of the horizontal portion of the block 5. This recess opens along the back face of the upright leg 7.

Vertical grooves 10 are formed in the inner side walls of the recess 9 and in these are housed the ends of a short iron bar 11 and said bar is held in place by the dove-tailed blocks 12 which close the top ends of the vertical grooves.

A coil of copper wire 13 of suitable gauge encircles the bar 11 and thus forms a small electromagnet and the terminal ends 14 of the wire coil extend into the metal tubes 15 which are embedded in the horizontal portions of the block 5 and which are open at the ends of the block.

Small set screws 16 are threaded through the bottom or outward side of a block to enter the tubes 15 to engage and hold the wires 17 of the electric circuit.

Embedded in the centre of the inner side of the upright leg 7 of the block 5 is a metal plate 18 and centrally thereof there is formed therein a needle point bearing recess to receive the pointed end of a small steel spindle 19 and upon this spindle is mounted a thin steel plate 20.

A plate 21, preferably of brass, is formed in a Z shape, the bottom leg 22 of which rests upon the top of the block 5 and is secured thereto

by a screw 23. The upright portion extends parallel with the upright leg 7 of the block and has a needle point bearing in the inner side in which the correspondingly tapered end of the spindle 19 is journaled.

A circular orifice 24 is formed in the plate 21 which is arranged to align with the orifices 2' in the leg 7 and the orifices 2 in the face plate.

A long narrow plate 25 of magnetized steel is embedded in the outer face of the upright leg 7 centrally of the width thereof and in vertical alignment and the magnetic influence of this plate holds the plate 20, which is mounted to rotate with the spindle 19 in the needle point bearings, in a vertical position to intercept a beam of light projected through the orifice 24 in the plate 21 preventing the light from showing through the ground glass plate 6 in the openings 2 of the face plate.

A stop lug 26 is arranged on the inner side of the upright leg 7 to form a positive stop to limit the swinging movement of the plate 20.

When an electric current is passed through the coil 13 the magnetic flux influencing one end of the plate 20 causes it to swing upon its pivot to clear the light opening and allow the beam to shine through, but immediately the flow of current through the coil is discontinued the magnet 25 exerts an influence upon this plate to swing it back to close the orifice.

The preferable form of assembly of the units herein described is shown in Figure 2, where two units are arranged with the legs 7 against the inner side of the end plates of the casing 3 where two other units are arranged with their end legs 7 abutting respectively the underside of the top plate 4 and the upper side of the bottom plate. The length of the bottom legs of the unit and the respective width is such that six of these units will fit snugly into the casing.

A retaining plate 26' which is adapted to fit in between the units thus assembled is provided with a converging hood member 27 into which is inserted the socket 29 of an electric lamp 30.

It is preferred to place a glass sheet 31 between the lamp 30 and the perforated plates 21 of the unit members and this may be coloured if desired, so that a coloured light will show through the orifice 2 in the face plate.

In the use of this device each unit is connected up with a particular lamp circuit, that is to say, there may be one connected up with the full power circuit of the head lamps, another connected in the "dimmer" circuit of the head lamps, one with the side lamps, another with the "tail" light and another with the "stop" light, which is the usual lighting equipment on a car.

The lamp 30 is connected to a common lead and lights when any one of the circuits is closed and upon the closing of any one circuit, the current flows through the electro-magnet of the particular unit and operates the pivotal plate 20 to swing clear of the light orifice, allowing a beam of light from the light 30 to shine through to the corresponding orifice 2 in the face plate. The driver can see at a glance after operating the switch whether the particular lights turned on are burning, as of course if a lamp is burned out, the operation of the switch does not close the circuit. Thus there is constantly before the driver an indication as to whether his bright lights, his dim lights, his side, rear or stop lights are operating and he has the assurance that he is travelling with

proper lights or else he is aware of the defects and can take the necessary steps to remedy same.

It may be found desirable to operate the shutter plate by spring means and in Figure 8 a modified construction is shown in which a fine helical spring 32 is connected at one end to the spindle of the plate 20 and at the other end to a bracket 33. The magnetic influence of the electro-magnet exerts its force against this spring to swing the shutter plate away from the light orifice.

Also in Figure 8 a slight modification of the magnet construction is shown, the core of the magnet being formed by a screw 34 secured in a bracket 35.

A device constructed as herein described is extremely compact, it is very simple to make, and of a rugged nature so that it will not get out of order but if any fault should occur in any one of the units, such unit is easily removed and replaced by another.

The device has been described as particularly applicable to use in motor cars but it will be readily appreciated that such structure can be utilized to advantage in many forms of indicators.

The magnet 13 may be arranged with one pole in alignment with the shutter, one such an arrangement being illustrated in Figure 2'.

What I claim as my invention is:

1. An indicating device comprising a casing having a light-penetrable front wall and an open rearward end, a plurality of interchangeable unit signal members nested in said casing behind said light-penetrable wall and each having a light-emitting orifice adjacent said wall, a shutter member mounted on each of said units and movable into and out of light-obscuring relation to the orifice thereof and normally retained in its light-obscuring relation to the orifice, magnetic means co-operating with each of said units adapted to swing said shutters clear of the orifices, closure means for the rear of said casing spaced rearwardly of all of said nested units, and a lamp enclosed between said units and said closure means adapted to direct light rays through any of the non-obstructed orifices.

2. An indicating device comprising a casing having a plurality of orifices in the front wall thereof and an open rearward end, a plurality of unit signal members nested in said casing and each having an orifice aligned with an orifice in said casing, a pivotal shutter arranged in each of said units adapted to cover the orifice therein, means in each of said units adapted to hold the shutter in the obscuring position, means co-operating with each of said units adapted to swing said shutters clear of said orifices, a hood member fitting in the said open end of the casing and forming a light chamber rearwardly of the orificed portions of said signal member, and a lamp enclosed within said hood chamber.

3. An indicating device as claimed in claim 2 in which said indicating units are removably nested about the wall of the casing, and having the orificed portions grouped toward the central region of the front wall of the casing.

4. An indicating device as claimed in claim 2 in which said indicating units are removably nested about the wall of the casing, and having the orificed portions grouped toward the central region of the front wall of the casing, and said hood member being disposed in overlapped relation to said removable indicating units and serving to re-

tain all of said units in their assembled relation in the casing.

5 5. An illuminated signal indicator for indicative co-operation with automobile lamp circuits to indicate a failure of the lamp or circuit there-
10 of, comprising in combination, a magnetically sensitive pivotally displaceable device having a portion adapted to act as a shutter and a second portion for disposition between zones of
15 variable magnetic influence, a wall disposed forwardly of said shutter portion and having a light-penetrable zone, a light source arranged rearwardly of said wall and shutter portion, said
20 shutter portion being displaceable to and from light-obstructing and light-releasing relation respectively to said light-penetrable zone in accordance with changes in the relative magnetic influences of said magnetic zones, and co-operative
magnetic means forming said zones of variable
magnetic influence and including an electro-magnet having a winding for connection with a se-

lected one of the said lamp circuits and influentially disposed at one side of said second-mentioned portion, said co-operative magnetic means also including a part disposed on the opposite side
5 of said second-mentioned portion, said respective parts of the co-operative magnetic means being
oppositionally related to said second-mentioned
portion on opposite sides thereof to retain the
shutter portion in one of its said positions in
10 relation to said light-penetrable zone, whereby on de-energization of said electro-magnet winding the oppositional influence of the other part of
said magnetic means acting on the reverse side
of said second-mentioned portion effects the displacement of the shutter portion into the other
15 of said positions in relation to said light-penetrable zone to provide a signal or indication of failure of the lamp circuit with which the de-energized winding is associated.

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