April 10, 1928. 1,665,640

C. I. RANDLE ET AL

AUTOMATIC AUTOMOBILE LIGHT INDICATOR

Filed Sept. 22, 1925 2 Sheets-Sheet 1

Fig. 1.

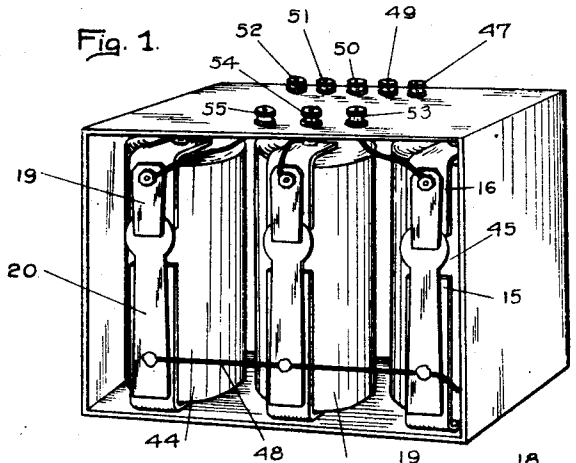


Fig 2.

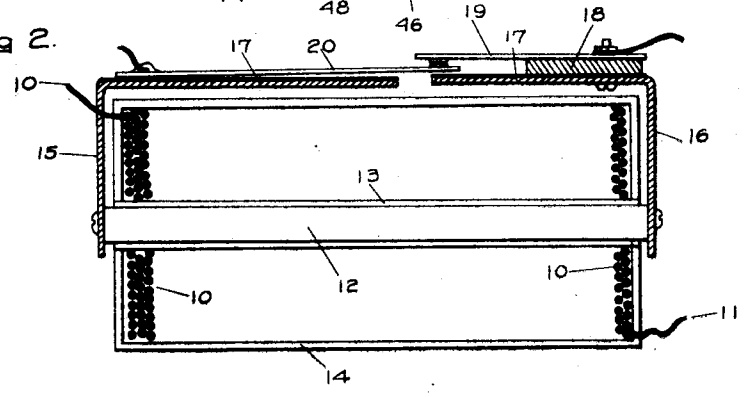


Fig. 5

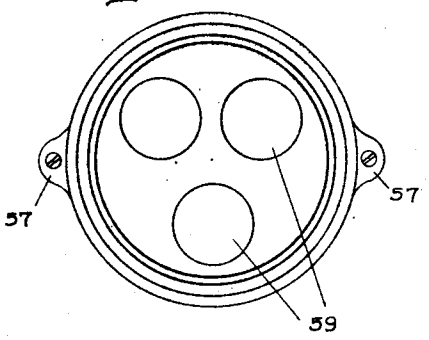
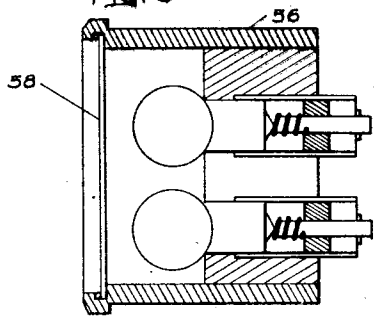


Fig. 6



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Filed Sept. 22, 1925 2 Sheets-Sheet 2

Fig 3

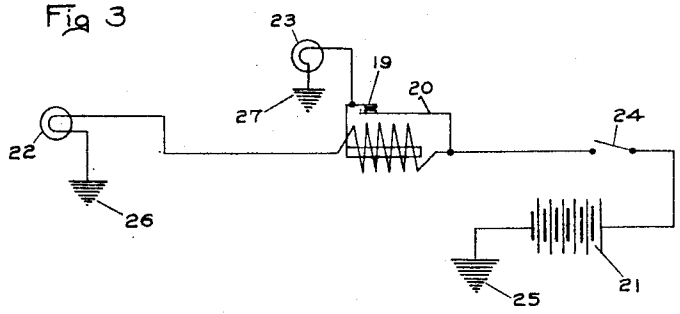
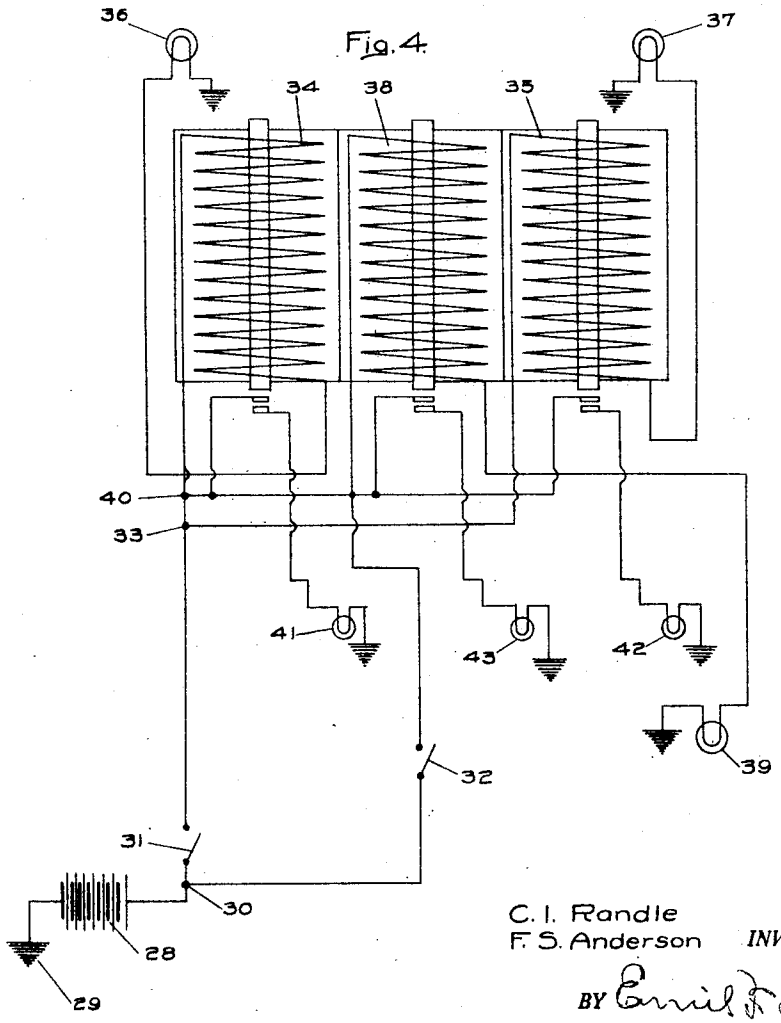


Fig. 4.



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UNITED STATES PATENT OFFICE.

CLYDE I. RANDLE AND FRANK S. ANDERSON, OF EUREKA, CALIFORNIA; SAID ANDERSON ASSIGNOR TO GILBERT SUTHERLAND, OF EUREKA, CALIFORNIA.

AUTOMATIC AUTOMOBILE LIGHT INDICATOR.

Application filed September 22, 1925. Serial No. 57,978.

Our invention relates to automatic light indicators, the object of the invention being the provision of a device for instantly indicating to the driver of the automobile any failure in the head lights or tail light of the automobile.

The conditions under which all automobiles are driven are such that filaments and connections are easily broken so that the lights are apt to be extinguished without the driver's knowledge. Wherever traffic congestion at night is at all great, such defects in the lighting system of the automobile prove to be a serious menace which is recognized in the traffic laws of a number of the States. Our invention is designed for eliminating this menace and for relieving the driver of the annoyance and expense of being caught while unwittingly violating the traffic laws. Furthermore, it is the object of our invention to provide such a device which may be easily installed by any mechanic and which will instantly point out the defective light. Other objects will be referred to in the following description.

Referring now to the drawings,

Figure 1 is a view in perspective of the coil box, the lid being removed to show the arrangement of the coils and magnets.

Figure 2 is a sectional view of one of the coils and its magnet and showing also the terminals of both the main circuit and the branch circuit.

Figure 3 is a diagram of a single coil showing the main circuit through a head or tail light and showing also the branch circuit through the corresponding pilot light.

Figure 4 is a schematic wiring diagram of the entire system involving two head lights and a tail light and the respective pilot lights.

Figure 5 is a plan view showing the pilot light arrangement on the instrument dash of the automobile.

Figure 6 is a sectional view of the part shown in Figure 5.

Referring to Figure 2, the main circuit is through the coil 10 having its terminals at 11. The coil surrounds the core 12 of an electro-magnet, the coil being spaced from the magnet by a cylinder 13 of any desired suitable insulating material. The coil is also entirely surrounded by insulating material 14, only the ends of the core 12 projecting out from the insulation. L-shaped straps 15 and 16 of soft iron are secured by means of screws or other suitable connections to the core 12 at its opposite extremities, the straps 15 and 16 being of such lengths that they do not meet at their inner ends. The outer surfaces of the straps are covered with suitable insulation 17, there being additional insulation 18 on the inwardly projecting arm of the strap 16. Secured to the strap 16, but insulated therefrom, is a rigid bar 19 of suitable conducting material such as steel or brass. Secured to the strap 15, but not necessarily insulated therefrom, is a resilient conductor 20 which is normally in contact with the conductor 19.

The action of this coil will be apparent by referring to the diagram in Figure 3. The current from the battery 21 normally flows through the coil and through the light 22 which may be either a head light or a tail light. This main circuit includes the coil which energizes the magnet, causing the resilient conductor 20 to be drawn toward the magnet and away from its contact with the conductor 19 so that no current will flow through the branch circuit. If for any reason, however, the main circuit is broken, the magnet instantly becomes dead and releases the armature 20 into contact with the conductor 19 to close the branch circuit through the pilot light 23. The circuit also includes a switch at 24, the battery 21 being grounded at 25 and the lights 22 and 23 being provided at 26 and 27 respectively.

The advantages of the coil and magnet construction shown in Figure 2 will be readily apparent when considering the relation of that construction to the coil arrangement in the coil box as shown in Figure 1. The magnets and contacts are readily accessible after removing the lid of the box and they require the minimum amount of space for their assembly. The magnetic contacts are better protected than they would be if they were positioned at one of the ends of the core 13 which is the usual arrangement. A further great advantage resides in the fact that the magnetic "pull" of the core is applied from both ends of the core, thus giving a quicker and more effective response.

In applying this invention to the automobile lights, the fact that there are two branch circuits must be taken into consideration. One of these branch circuits serves the two head lights of the automobile while the other

serves the tail light, the two branch circuits being controlled from separate switches. In Figure 4 is shown the wiring diagram for applying this principle to the three main lights of an automobile. The battery is shown at 28, it being grounded at 29. The current from the battery branches at 30, the two branches being controlled through switches 31 and 32. The branch current flowing through the switch 31 is again branched at 33, one of the two branches serving the coil 34 and the other serving the coil 35. The current flowing through the coil 34 passes through the head light 36, while the current flowing through the coil 35 passes through the head light 37. The current flowing through the switch 32 passes through the coil 38 and through the tail light 39. The current passing through the switch 31 is also branched at 40 to serve the three magnetic contacts of the coils, each of these magnetic contacts having a conductor passing through the corresponding pilot light. It will readily be seen that in case the light 36 goes out for any reason whatever, the magnetic contact of the coil 34 will be closed to cause the current to flow through the pilot light 41. Likewise, if the light 37 becomes extinguished, the pilot light 42 will be illuminated. If the tail light 39 goes out its corresponding pilot light 43 will immediately indicate the fact.

Figure 1 shows the concrete embodiment of the principle illustrated in Figure 4. The coils 44 and 45 serve their respective head lights while the coil 46 serves the tail light of the automobile. In the interior wiring of the coil box the binding post 47 is connected with the coils 44 and 45 and is also connected through the conductor 48 to the magnetic contacts of all of the coils. The current entering the coil 45 through the binding post 47 leaves the coil through the binding post 49, the binding post 49 being connected to one of the head lights. The current entering through the binding post 50 passes through the coil 46 and out through the binding post 51 and thence through the tail light. The current entering the coil 44 from the binding post 47 passes out through the binding post 52 to the second of the head lights. The binding posts 53, 54, and 55 are connected with the second element of the magnetic contacts of the three respective coils, the binding post 53 serving the magnetic contact of the coil 45 and the binding post 55 serving the magnetic contact of the coil 44. The coils are fixed in compact and convenient position within the coil box as shown and the coil box is then partly filled with a more or less plastic insulator like asphalt, which serves both to insulate and to bind the parts together. In the installation of the device it is only necessary to provide three pilot lights in convenient position and to make the seven connections above described.

The best position for the pilot light is, of course, the instrument dash in front of the driver. In Figures 5 and 6 we have shown a connection which makes the installation an easy matter. The cylinder 56 is adapted to pass through a suitable aperture in the instrument dash and this cylinder is provided with a rim which may be given a neat and attractive appearance, the rim serving as a shoulder for engaging the edge of the aperture. The rim is also provided with two apertured ears 57 for receiving screws for securing the cylinder 56 in position on the dash. The cylinder also has a front window 58 of frosted glass. Inside the cylinder there are three lamp sockets for the pilot lights 59, the window being removable to give convenient access to the pilot lights.

Our automatic automobile light indicator has been found to be entirely practical and effective under the most severe driving conditions, and with no interference with the lighting system or other parts of the electrical system of the automobile. It is exceedingly simple to install and may be installed by any mechanic, skilled or unskilled, on any automobile now on the market. When once installed, it is practically "fool proof" and its construction is such that no part is liable to get out of order. Both the coil box and the support for the pilot lights are so made that they may be installed in any desired position or location on the automobile. The pilot lights will be dark except when a lamp fails to burn for any cause whatever, such as a broke wire, loose contact, or short circuit in the wiring system, and when such trouble occurs the pilot light will give immediate warning and at the same time will identify the particular light or lights in which the trouble is to be found. There is practically no drop in potential across the lamps, the drop being about one-tenth of a volt or less than one and six-tenths per cent. The coil box is light in weight and so compactly arranged that its small size makes its installation possible in any small unused space anywhere in the automobile. The connections within the coil box are mostly embedded in insulating material, thus eliminating almost entirely the liability of short circuits or broken connections within the coil box. The magnetic contacts are so placed as to utilize the greatest possible pull of the magnets and so as to be in the most convenient position possible when it becomes necessary to adjust them.

Having thus described our invention in such full, clear, and exact terms that its construction and operation will be readily understood by others skilled in the art to

which it pertains, what we claim as new and desire to secure by Letters Patent of the United States is:

A coil for use in an automatic automobile light indicator circuit comprising a core, an insulating casing surrounding the core and extending thereabout, straps carried on the ends of the core and extending across the opposite ends of the casing and along one side thereof exterior of the casing and terminating in spaced relation to each other to provide a magnet, a coil mounted in the casing about the core and adapted to be connected in the light circuit to energize the coil when the light is on, a rigid conductor bar mounted in insulated relation on one of said straps and spaced outwardly from the end thereof, a resilient magnetic conductor bar insulated on the other strap and extending across the ends of the straps and beneath the rigid bar and normally bearing thereagainst to close a branch circuit therethrough.

In witness whereof we affix our signatures.

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FRANK S. ANDERSON.