

1,333,422.

Fig. I.

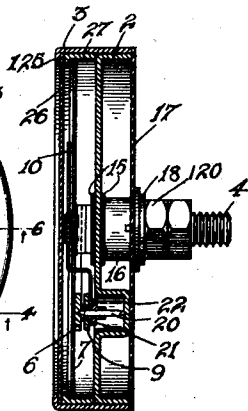


Fig. 2.

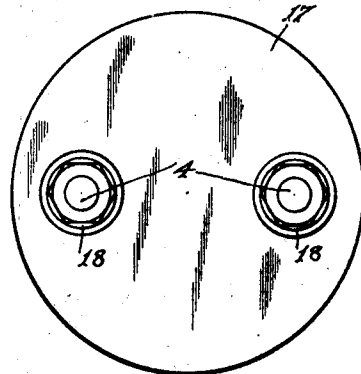


Fig. 3.

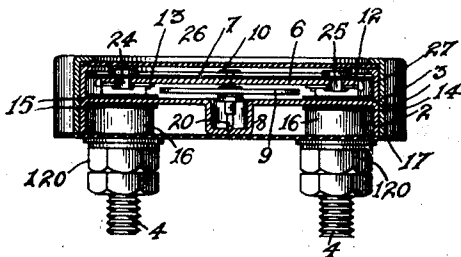


Fig. 4.

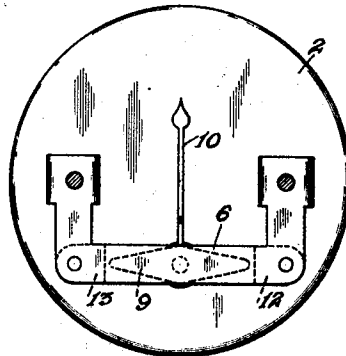


Fig. 5.

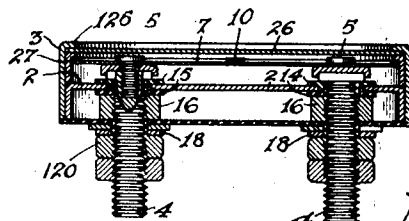


Fig. 6.

Wm Bergahn

Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM KAISLING, OF CHICAGO, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

POLARITY-INDICATOR.

1,333,422.

Specification of Letters Patent.

Patented Mar. 9, 1920.

Application filed June 16, 1916. Serial No. 104,138.

To all whom it may concern:

Be it known that I, WILLIAM KAISLING, a citizen of the United States of America, residing in Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Polarity-Indicators, of which the following is a specification.

My invention relates in general to a device for visualizing the direction of the current flowing in a circuit and is particularly adapted for use in connection with the ignition and lighting circuits of an automobile or the like. However, I do not wish to be limited to this particular use of my device as it is apparent that my invention is of broader scope and may be connected in any circuit where it is desirable to know the direction of flow of current.

In connection with the present type of lighting and ignition systems used on automobiles, it is necessary to provide a generator and an accumulator, the one for producing current and the other for storing the produced current for future use, and due to the varying amounts of current consumed by the ignition and lighting apparatus, it becomes desirable to know whether the generator is producing sufficient current to supply the current consumed by the said apparatus, or whether the accumulator is supplying the current necessary for carrying the load. To accomplish this result, I have produced a device that may be connected in circuit with the above referred apparatus to visualize the direction of flow of current, thereby making it possible to ascertain the working condition of the electrical circuits.

It is the object of my invention to produce an improved device of this class which will embody desirable features and advantages all in a simple, efficient, and economical manner; and to the accomplishment of this object and such others as may hereinafter appear, the invention consists in the novel details of construction, parts, and combination of parts described, and particularly pointed out in the appended claims, reference being had to the accompanying drawings forming a part hereof, in which the same reference characters in-

dicate like parts throughout the several views, and in which—

Figure 1 is a front view of the device of my invention;

Fig. 2 is a sectional side view of Fig. 1 taken along line 2—2 of Fig. 1;

Fig. 3 is a rear elevation of Fig. 1 showing the terminals;

Fig. 4 is a sectional view of the device taken along line 4—4 of Fig. 1, showing the moving parts of the device;

Fig. 5 is a front view of the device with the cover cap and indication card removed;

Fig. 6 is a sectional view taken along line 6—6 of Fig. 1 and looking in the direction of the arrows shown.

Referring now more in detail to my invention as illustrated, it comprises a cup-shaped mounting plate 2 upon which the operating mechanism of the device is mounted, and a cover cap 3 for inclosing and protecting this mechanism.

A pair of terminal bolts 4 provided with rectangular heads, that project above the top surface of the mounting plate 2, are insulatively secured through the medium of the insulating washers 14 and 15, to the said mounting plate 2 and are there held in place by means of the cylindrical slotted nuts 16. A back plate 17 of micarta plate or any other suitable insulating material is held against the cylindrical nuts 16 by means of nuts 120 that have screw-threaded engagement with the studs 4 and are retained in position by means of the split washers 18.

A U-shaped current carrying strip 6 is provided with integrally formed side pieces adapted to fit over the shoulders of the rectangular heads of the studs 4 to secure the current carrying strip 6 against horizontal movement, and is securely held in position by means of round-headed screws 5. Integrally formed with the cup-shaped member 2 is a cylindrical depression cup 8 shown in sectional view in Figs. 2 and 4. Pivotaly mounted between the current carrying strip 6 and the bottom surface of the cup 8 is a polarized diamond-shaped magnet 9. The shaft 20 which pivotaly supports the magnet 9 is provided with an aluminum pointer

10 which projects through a slot 11 in the indication card 7 and has bearing surfaces in the current carrying strip 6 and in the bottom surface of the cup 8. The magnet 5 9 and the pointer 10 may be fastened to the shaft 20 in any desirable manner, preferably, as shown in Fig. 2 by pressing a cylindrical collar 21 provided with a flange 22 over the shaft 20 and by then placing the 10 pointer 10 and the magnet 9 over the upper portion of the collar 21 and securing them thereto by staking over the upper portion of the collar 21. A pair of iron plates 12 and 13 are secured to the current carrying 15 strip 6 in any desirable manner, preferably by punching orifices 24 and 25 in the strip 6 and by then riveting the raised portion of the metal over the upper surfaces of the said plates 12 and 13.

20 The function of the soft iron plates 12 and 13 is to maintain the pointer 10 when no current is traversing the current carrying strip, in its normal position, which position is indicated by the reference character 0 no 25 matter what position the device may be in.

One extremity of the cylindrical cap 3 is spun over to form a shoulder 125 against which a circular transparent window 26 is held in place by means of a cylindrical collar 27 which fits tightly within the cylindrical cap 3.

Having described the parts that go to make up my device, I will now explain its function and use. In the case where my device is used in connection with the electrical 35 circuits of an automobile, it is so connected in circuit that current will flow through the strip 6 in one direction if the generator is charging the accumulator and in the other 40 direction if the accumulator is supplying current to the operating circuits. The flow of current through the current carrying strip sets up a magnetic field around said strip, as is well understood, which causes the polarized 45 magnet 9 to attempt to turn at right angles to the current carrying conductor, in one instance to the left if the current is traversing in one direction and in the other instance to the right if the current is flowing in the op- 50 posite direction, thus causing the pointer to be moved to the right to indicate that the accumulator is being charged or to the left to indicate that the accumulator is supplying current to the operating circuits.

55 From the foregoing description, it is believed that the general utility and the function of my device will be readily understood without showing and describing circuit connections in detail.

60 In illustrating my invention, I have chosen a preferred form, but it is to be understood that many changes and modifications thereof may be made, therefore I do not desire to be limited to the exact structure as shown, but aim to cover all such

changes and modifications as come within the spirit and scope of the appended claims.

What I claim as new and desire to secure by United States Letters Patent, is:

1. A device of the character described 70 comprising a mounting plate, a current carrying conductor secured to said plate, a polarized magnetic needle rotatably mounted between said plate and said conductor, a soft iron member supported by 75 said conductor to maintain said needle in its normal position when current is not passing through said conductor, and means movable with said needle to indicate the direction that current is traversing said conduc- 80 tor.

2. A device of the character described for visualizing the direction of flow of current through a circuit, a flat current carrying conductor for said device, an oscillatory 85 elongated polarized member lying in a plane parallel to the plane of said conductor, an indicating member secured to said elongated member, and a soft iron member carried by said flat current carrying conductor for 90 maintaining said indicating member in its normal position so that a flow of current through said conductor will cause said indicating member to visualize the direction of flow of current through said conductor. 95

3. A device of the character described including a mounting plate, a pair of terminals connected to said mounting plate, a U-shaped current carrying strip bridged across said terminals, an oscillatory polarized 100 needle pivotally secured between said mounting plate and said current carrying strip, a magnetic piece secured to said current carrying strip, to hold said polarized needle in its normal position, and an indicator 105 attached to said polarized needle for visualizing the direction of current flow through said current carrying strip.

4. A device of the character described including a mounting base, a flat current 110 carrying strip secured to said mounting base, an oscillatory polarized needle pivotally secured between said current carrying strip and said mounting base and having bearings in said current carrying strip and said mount- 115 ing base, a magnetic member secured to said strip to maintain said needle in its normal position when there is no current passing through said conductor, and an indicating device movable with said polarized 120 needle for visualizing the direction of current flow through said conductor.

5. A device of the character described for visualizing the direction of flow of current through a circuit, including a mounting 125 base, a cylindrical depression made in said base, a pair of terminals secured to said base, a flat current carrying conductor bridged across said terminals, an oscillatory polarized needle pivotally secured between 130

said conductor and said mounting base and having bearings in said conductor and in said depressed portion of said mounting base, and means for maintaining said polarized needle in its normal position when current is not traversing said conductor.

6. A device of the character described for visualizing the direction of flow of current through a circuit, including a mounting base, a cylindrical depression made in said base, a pair of terminals secured to said base, a flat current carrying conductor bridged across said terminals, an oscillatory polarized needle pivotally secured between said conductor and said mounting base and having bearings in said conductor and in said depressed portion of said mounting base, and an indicating device movable with said polarized needle for visualizing the direction of flow of current through said conductor.

7. A device of the character described including a circular base plate, a cup-shaped depression in said base plate, a pair of terminals secured to said base plate, a current carrying conductor connected across said terminals, a polarized magnetic needle mounted on a shaft below said current carrying conductor, one end of said shaft extending into said depression, and pieces of magnetic material mounted diametrically opposite each other for maintaining said polarized needle in normal position when no current is traversing said current carrying conductor.

8. A current visualizing device including a mounting plate, a current carrying conductor supported by said plate in a plane parallel to the plane of said plate, a permanently polarized magnetic needle rotatably mounted in a plane parallel to the plane of said plate and current carrying conductor, a non-polarized magnetic member supported by said conductor to maintain said needle in its normal position, and means rotatable with said needle to indicate the direction of flow of current through said conductor.

9. A current visualizing device including a mounting plate, a pair of terminals secured to said mounting plate, a current carrying conductor bridged across said terminals, a permanently polarized magnetic needle mounted in juxtaposition to said current carrying conductor, a pair of soft iron members supported by said conductor for maintaining said needle in its normal position, a dial secured to said terminals, and an indicating member adapted to be rotated over said dial by said polarized needle to visualize the direction the current is traversing said conductor.

Signed by me at Chicago, county of Cook and State of Illinois, in the presence of two witnesses.

WILLIAM KAISLING.

Witnesses:

G. A. YONCHOWSKI,
WM. BERGHAM.