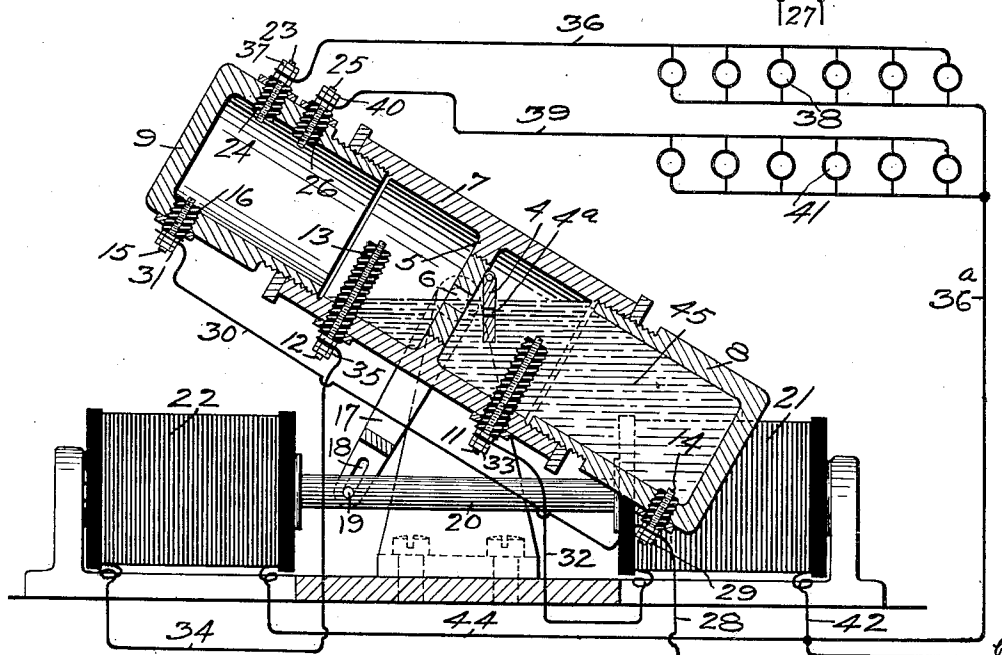
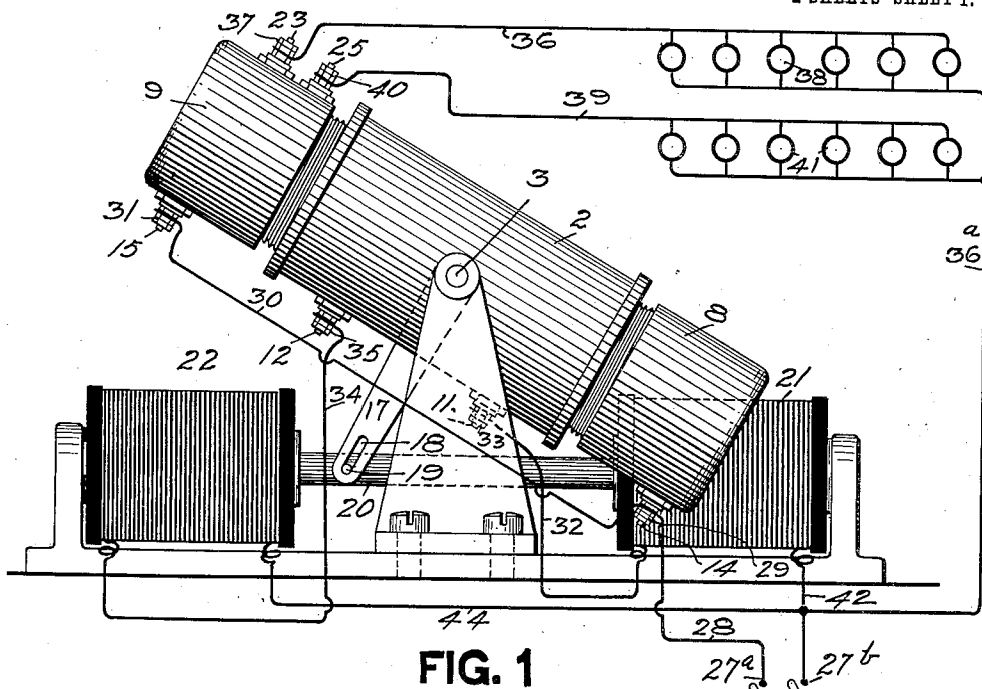


R. D. DE WOLF.
ELECTRIC SIGN FLASHER.
APPLICATION FILED NOV. 30, 1906.

972,516.

Patented Oct. 11, 1910.

2 SHEETS—SHEET 1.



WITNESSES.
J. R. Keller
Robert C. Fottan

INVENTOR.
R. D. De Wolf.
By Ray Fottan Winter
Attorney

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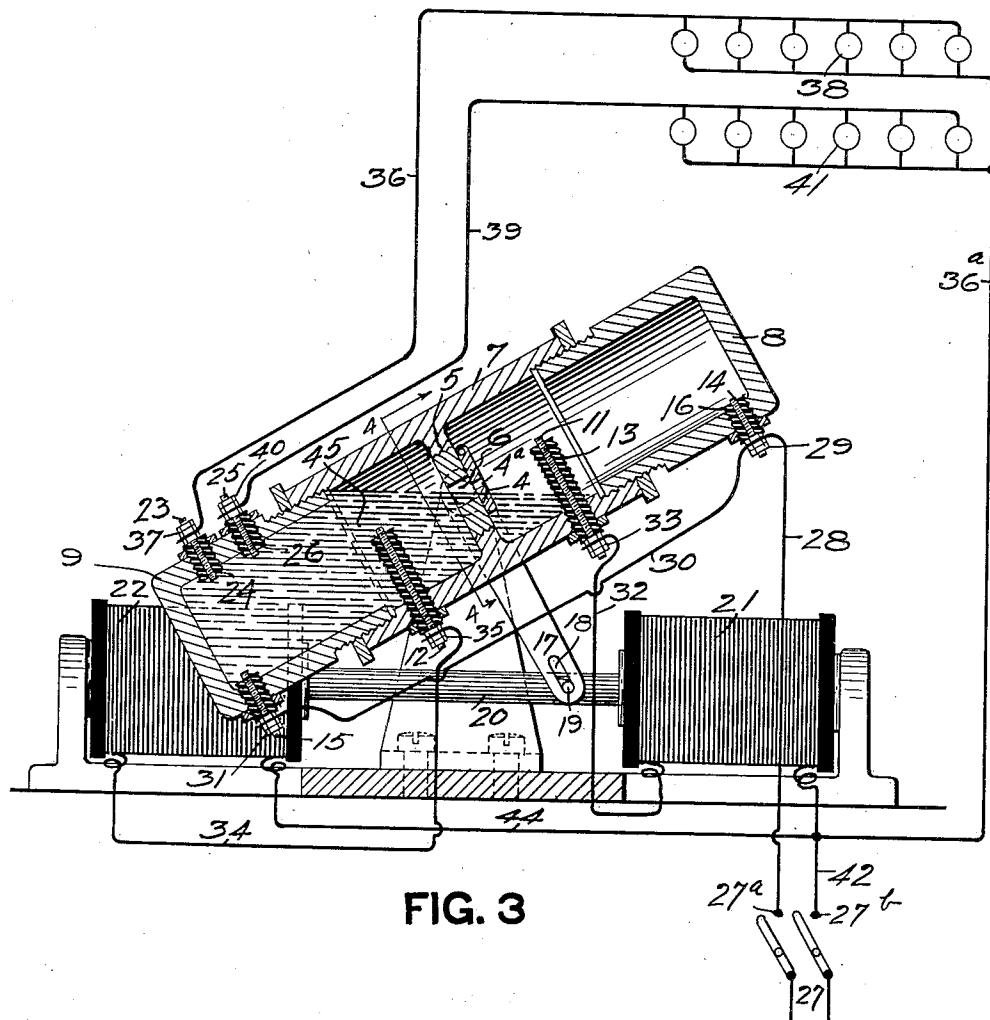


FIG. 3

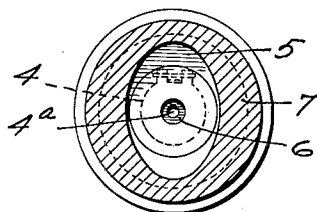


FIG. 4

WITNESSES.

J. R. Keller
Robert C. Zotten

INVENTOR.

Roger D. De Wolf
By Ray Zotten & Winter
attorneys

UNITED STATES PATENT OFFICE.

ROGER D. DE WOLF, OF PITTSBURG, PENNSYLVANIA.

ELECTRIC SIGN-FLASHER.

972,516.

Specification of Letters Patent.

Patented Oct. 11, 1910.

Application filed November 30, 1906. Serial No. 345,822.

To all whom it may concern:

Be it known that I, ROGER D. DE WOLF, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Electric Sign-Flashers; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to an electric flasher and more particularly to a device of this character which may be employed in connection with electric signs in which the lamps composing the sign in the form of letters, or other figures or designs, are lighted and extinguished automatically and at certain predetermined periods.

The object of my invention is to provide a simple device of this character in which the making and breaking of the circuit to the lamp is obtained without liability of the burning out of the contacts, while at the same time the illumination takes place at regular periods, the time between each flash being accurately predetermined.

To these ends my invention comprises, generally stated, an electric sign flasher consisting of a tilting shell, or casing, having communicating compartments, a fluid electric conductor contained within said shell, or casing, an electric circuit, one or more lamps in said circuit, electromagnetic mechanism for tilting said shell, or casing, means for passing the current through said fluid to said lamps, and means for operating said mechanism by the flow of said fluid from one compartment to the other.

In the accompanying drawing, Figure 1 is a side view of my improved electric flasher; Fig. 2 is a longitudinal sectional view of the same, showing the flasher in one position; Fig. 3 is a like view showing the flasher in the opposite position; Fig. 4 is an enlarged view of the central portion of the flasher showing the partition wall which divides the shell, or casing, and the swinging plate which retards the flow of the fluid in one direction.

In the drawings the numeral 2 designates a cylindrical central portion of a shell, or casing, of suitable material which is pivotally mounted as at 3 upon a suitable support so as to be tilted or swung to either side to rest at the desired angle. This central portion 2 is hollow and is provided with the partition 5 having the opening 6 which brings both compartments of the shell, or

casing, 7 into communication with each other. A swinging plate 4 is hinged to the partition 5, said plate having the opening 4^a coinciding with opening 6, but smaller than said opening. The end sections 8 and 9 are threaded into the ends of the central section 2 and form part of the shell, or casing 7.

Extending up within the central section 2 and screwed into threaded openings 10 therein are the electrical contacts 11 and 12. These contacts are provided with insulating bushings 13. Similar contacts 14 and 15 are secured within the end sections 8 and 9 of the shell 7, said contacts being insulated by the bushings 16. An arm 17 is rigidly attached to the central portion 2 of the shell, said arm having the slot 18 therein which is engaged by the pin 19 upon the plunger 20. The plunger 20 is adapted to enter the electro-magnetic coils 21 and 22 automatically, as fully hereinafter set forth. Secured to section 9 of the shell, or casing, is the contact 23 which is provided with insulating bushings 24. A like contact 25 is secured to the end section 8 with an insulating bushing 26.

The circuit is made up in the following way: Located at 27 is a suitable switch connected up to a source of electrical power and leading from point 27^a of said switch is the conductor 28 which is connected by a suitable binding-screw 29 to the contact 14. A conductor 30 is connected to the binding-screw 29 and is connected at its opposite end by the binding-screw 31 to the contact 15. A conductor 32 is connected at one end to one end of the coil of the electro-magnet 21 and at its opposite end is connected by the binding-screw 33 to the contact 11. A conductor 34 is connected at one end to one end of the coil of the electro-magnet 22 and at its opposite end is connected by the binding-screw 35 to the contact 12. The conductor 36 is connected by the binding-screw 37 to the contact 23 and passes through the lamps 38 and thence by conductor 36^a to the point 27^b of the switch. A conductor 39 is connected by the binding-screw 40 to the contact 25 whence it passes through the lamps 41 and joins the conductor 36^a which is connected to point 27^b of the switch 27. A conductor 42 is connected to one end of the coil of the electro-magnet 21 and the other end is connected to the point 27^b of the switch 27. The conductor 44 is connected to one end of the coil

22 and at its opposite end to the point 27^b of the switch.

Within the shell, or casing, 7 is the mercury 45, or other suitable fluid which is a conductor of electricity, a sufficient quantity of said fluid being employed to make up the circuits as hereinafter set forth. As the shell 7 is preferably employed as part of the circuit, said shell, as well as the entire mechanism is preferably insulated to prevent grounding one side of the line.

The operation of my improved electric flasher is as follows: The parts in the position indicated at Fig. 2 where the shell is tilted to the right with the mercury substantially filling the right hand compartment of the shell, or casing, the operator turns the switch at 27 and completes the circuit. The current passes from point 27^a through the conductor 28 to the contact 14 and thence through the mercury to the contact 11 whence it passes by the conductor 32 through the magnetic coil 21 and thence by conductor 42 to point 27^b, thereby energizing coil 21. As soon as the coil 21 is energized, the plunger 20 is drawn into said coil and to the right, whereupon the lower end of the arm 17 is drawn in the same direction which acts to tilt the shell 7 upon its pivoted point 3, whereupon said shell 7 moves around to the position indicated in Fig. 3. By this tilting of the shell 7 the mercury will flow to the left hand end of the shell and will first envelop the contact 15. In the meantime, the contact 14 has been broken by the departure of the mercury therefrom. Owing to the small size of the opening 4^a in the plate 4 mercury flows slowly therethrough, and at this stage therefore still envelops the contact 11. The mercury first admitted through the openings 4^a and 6, however, has immediately enveloped the contact 15 so that the current now passes from the conductor 28 through the conductor 30 to the contact 15 where the mercury at that point will form a conductor between the contact 15 and the iron casing, whence the current will flow from the contact 15 through the mercury and iron casing and the mercury still remaining above the partition 5 to the contact 11. From the contact 11 the circuit passes by the conductor 32 through the coil 21, thereby energizing said coil to hold the casing in its new position until this circuit is broken by the retirement of the mercury from the contact 11, when, however, the weight of the mercury within the lower compartment maintains the casing in position. Owing to the opening in the plate 4 being smaller than the opening 6 in the partition 5, the flow of the mercury to the left hand compartment of the casing is slow. Accordingly, however, said mercury flows into the left hand compartment and as it gradually rises therein it first comes in contact

with the contact 23, thereby allowing the current to pass from 27^a through conductors 28 and 30 to contact 15, through the mercury to contact 23, through said contact to the conductor 36 and thence to the lamps 38 which will be lighted, and thence through conductor 36^a to point 27^b. As the mercury rises still further in the left hand compartment of the casing, it will necessarily come in contact with the contact 25, whence the current will pass through said contact and conductor 39 to the lamps 41 which will also be lighted, the circuit in this way being completed in the same manner as above. Upon still further rising of the mercury in the left hand compartment, it will finally reach the contact 12, whereupon the current will flow through said contact and conductor 34 to the coil 22, the mercury in the meantime having been withdrawn from contact with the contact 11. Accordingly, when the current passes through the contact 12 and conductor 34 to the electro-magnetic coil 22, said coil 22 becomes energized, while the coil 21 is deenergized. This acts to throw the plunger 20 to the left into the coil 22, whereupon the arm 17 is drawn into position to throw the shell back to the position indicated in Fig. 2, and the mercury flows back to the right hand compartment of the shell, breaking contact with the contact 15 at once and gradually breaking contact with the contacts 24 and 25, whereby the lamps 38 are first extinguished and following them the lamps 41. The coil 22 is, however, kept energized by the current which passes through the conductor 28 and contact 14 through the mercury covering said contact and the metal of the shell to the contact 12, thence by the conductor 34 to the coil 22. As soon, however, as the mercury reaches the contact 11, the circuit is completed to energize the coil 21, whereupon the plunger 20 is again reversed and the shell tilted to the position shown in Fig. 3, and the lamps 38 and 41 are flashed as hereinbefore described. In this manner, at regularly predetermined periods the shell is tilted by reason of the movement of the mercury relatively to the contacts and the circuits are made and broken in the manner herein set forth so as to light and extinguish the lamps at regularly predetermined periods.

It is apparent that the number of contacts similar to 23 and 25 is limited only by the length of the shell employed and as a consequence a number or bank of lamps may be employed and the sign be what is termed a spelling one. All the circuits are broken due to the movement of the mercury and the break takes place between the various contacts and the mercury, hence the contacts will not be burned. It is also apparent that by placing lamp contacts in the right hand compartment of the shell, a sec-

ond series of lamps may be operated, the first series being dark when the second series is illuminated and vice versa.

What I claim is:

5 1. In electric sign flashing devices, the combination of a tilting casing, a fluid conductor therein, an electric circuit including suitable contacts in said casing adapted to be closed by said fluid conductor, an electro-
10 magnet in said circuit provided with means for tilting said casing and thereby progressively transferring said fluid from one end to the other thereof, a plurality of further contacts in said casing, and lamps in circuit
15 with each of said contacts, the said contacts being arranged to progressively close and open the said circuits on the movement of the fluid conductor passing them.

2. In electric sign flashing devices the
20 combination of a tilting casing, a fluid electric conductor in said casing, electric circuits including suitable contacts in said casing, and adapted to be closed by said fluid conductor, electro-magnets in said circuits
25 provided with means for tilting said casing and thereby progressively transferring said fluid from one end to the other thereof, a plurality of further contacts in said shell or casing, and lamps in direct circuit with
30 each of said contacts, the said contacts being arranged to progressively close and open the said circuits on the movement of the fluid conductor passing them.

3. In electric sign flashing devices, the
35 combination of a tilting cylindrical casing, a fluid electric conductor therein, a partition therein provided with an aperture dividing the said casing into two compartments, an electric circuit including suitable contacts
40 in said casing adapted to be closed by said fluid conductor, an electromagnet in said circuit provided with means for tilting said casing and thereby transferring said fluid from one compartment to the other thereof,
45 a plurality of further contacts in said casing and lamps in circuit with each of said contacts, the said contacts being arranged to progressively close and open the said circuits on the movement of the fluid conductor passing them.

4. In electric sign flashing devices, the combination of a tilting casing, a fluid elec-

tric conductor therein, a partition therein provided with an opening and means for
55 retarding the flow of said conductor through said opening when passing in one direction, electric circuits including suitable contacts in said casing, electromagnets in said circuits provided with means for tilting said
60 casing and thereby transferring said fluid from one end to the other thereof, further contacts in said casing, and lamps in circuit therewith, said contacts being arranged to be progressively closed and opened on the movement of the fluid conductor passing
65 them.

5. In electric sign flashing devices, the combination of a tilting casing, a fluid electric conductor therein, a partition therein
70 dividing said casing into two compartments and provided with an opening and means for retarding the flow of the conductor in one direction therethrough, an electric circuit including a contact adjacent to the
75 outer ends of each of said compartments and a contact in each of said compartments adjacent to said partition, electromagnets in direct circuit with each of said last mentioned contacts, a further contact or con-
80 tacts in one of said compartments, and lamps in circuit therewith.

6. In electric sign flashing devices, the combination of a cylindrical metallic tilting
85 casing, a fluid electric conductor therein, a partition therein dividing said casing into two compartments and provided with an opening and means for retarding the flow of the conductor in one direction there-
90 through, electric circuits each including a contact adjacent to the outer ends of each of said compartments and a raised contact insulated throughout the greater part of its height in each of said compartments ad-
95 jacent to said partition, electromagnets in direct circuit with each of said last mentioned contacts, a further contact or contacts in one of said compartments, and lamps in circuit therewith.

In testimony whereof, I the said ROGER D. DE WOLF have hereunto set my hand.

ROGER D. DE WOLF.

Witnesses:

WM. A. SIPE, Jr.,
ROBT. D. TOTTEN.