Jan. 18, 1955 L. R. HARMON 2,700,083

FLASHER SWITCH

Filed March 22, 1952

FIG. 1

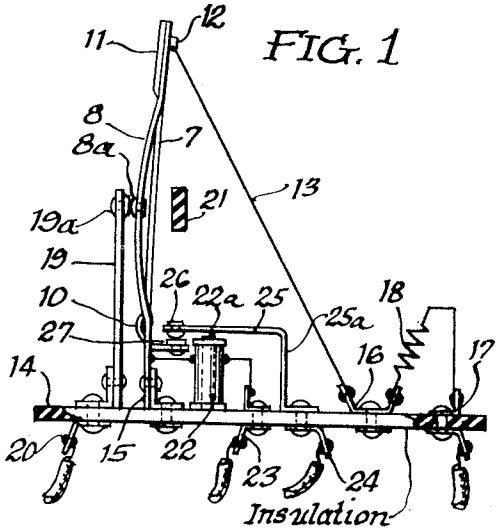


FIG. 2

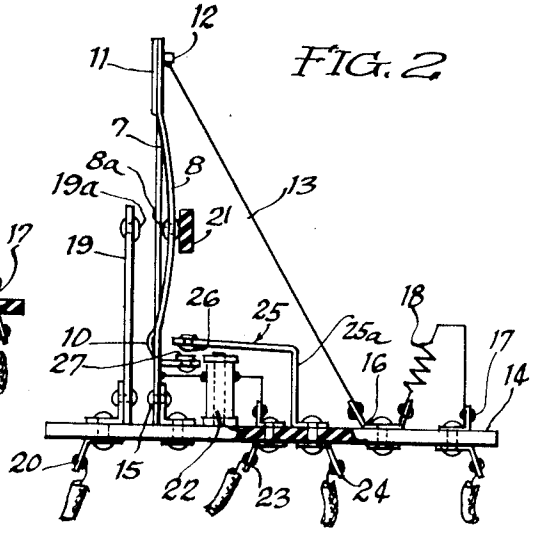


FIG. 3

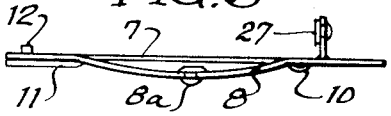


FIG. 4

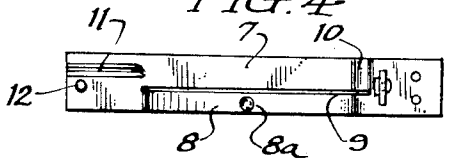


FIG. 5

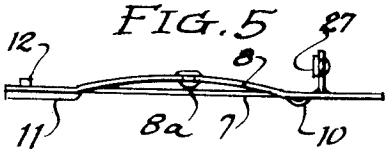
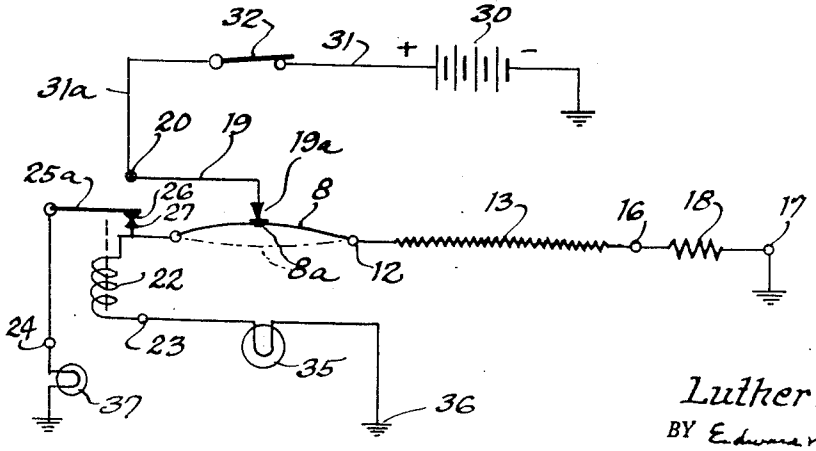


FIG. 6



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FLASHER SWITCH

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4 Claims. (Cl. 200—113)

This invention relates to a flasher switch and concerns itself primarily with a structure having a control circuit and a load circuit in which the load current is independent of the control current so that the latter will always function properly under varying loads or no load at all; in which the parts are so designed that the light bulbs will be completely and fully illuminated with full brilliancy as soon as the main switch is closed and in which the electrical contacts will produce a wiping action to reduce the objectionable transfer of contact material.

More specifically, the invention comprises a spring flipper made of beryllium copper or other suitable material and having a bowed deflectable portion connected in series with the light bulbs and a thermo-responsive wire connected to the flipper and then directly to ground, a source of energy and a conductor extending from the source of energy for normally engaging the bowed portion of the flipper where the current splits, a part going thru the flipper to the light bulbs and a part going thru the thermowire directly to ground and hence to the source of energy; thus making the control current independent of the load current.

At the present time, the flasher switches of this type now on the market examples of which are illustrated in Patent Nos. 2,357,635 and 2,308,522 have the light bulbs in series with the control circuit or thermowire with the result that variations of any material extent in the lamp load is impossible since neither the light bulbs or control circuit will function properly under appreciable variations in lamp loads. In certain variations, the light bulbs will not flash at all, but will only flicker and the thermowire will not function properly. This objection is overcome in having the load current independent of the control current in accordance with the present invention. A further objection to switches now on the market is that they do not illuminate the light bulbs with full brilliancy; the switch herein produces a much higher degree of brilliancy.

One of the important objects of the present invention is to provide a flasher switch that includes a novel flipper unit carrying a contact element that cooperates with a contact element on a current carrying arm, there being also provided a thermo-responsive wire associated with the flipper for actuating the flipper under certain conditions to cause the flipper to move away from the arm and separate the contact elements from each other.

A further object is to provide a flasher switch wherein all of the aforementioned parts are mounted on a suitable insulated base with contact terminals connected to the respective parts.

Another important object is to provide a flasher switch of the above mentioned character wherein the flipper member includes a bowed portion carrying a contact element that normally is in circuit closing engagement with a contact element on the current carrying arm, the bowed portion being biased to effect such contact engagement relationship.

With these and other objects in view, this invention comprises the novel structure and combination of parts hereinafter described and more particularly pointed out and defined in the appended claims.

In the accompanying drawing which illustrates a preferred form of this invention and in which similar reference numerals refer to similar features in the different views:

Fig. 1 is an elevational view of a thermo-responsive switch involving this invention showing the parts in initial positions,

Fig. 2 is a view similar to Fig. 1, but showing the parts in lights "off" positions,

Fig. 3 is an edge view of a flipper constituting a part of this invention,

Fig. 4 is a plan view of the flipper shown in Fig. 3,

Fig. 5 is an edge view of said flipper similar to Fig. 3 but showing parts in different positions and

Fig. 6 is a wiring diagram of the circuit of the switch.

In referring now to the drawing, there is shown an electrical current conductive flipper **7** which is in the form of a plate made of beryllium copper. The flipper is provided with a bowed portion **8** adjacent one side edge, by cutting a slot **9** spaced a short distance from the edge of the plate; the distance of the slot from the edge of the flipper determining the width of the bowed portion **8** which of course can be varied. From the lower end of the slot **9**, there is a crimp **10** which extends to the opposite edge of the flipper, which crimp shortens the flipper and causes the slitted margin to bow to one side of the plate. Adjacent the upper end of the flipper, there is a strengthening rib **11** which extends downwardly from the top upon the opposite side of the center line of the flipper from the bowed portion **8**.

The bowed or deflectable portion **8** of the flipper which is spring-like is located adjacent one edge of the flipper so a marginal portion constitutes the bowed portion which can snap from one side to the other of the flipper. By placing the bowed portion **8** at the margin, it has a more sensitive action than if it were placed in the middle of the flipper with rigid side margins. This sensitive action makes the switch more responsive to the action of the thermo-responsive wire and reduces the necessary tension in the flipper for deflecting the bowed portion **8**. Adjacent the upper end of the flipper **7**, there is a securing means **12** which may be in the form of a peg or pin for the attachment of the thermo-responsive wire **13**.

The lower end of the flipper is rigidly secured to an insulated base **14** by means of an angle clip **15** and the thermowire **13** which is connected to the securing means **12** extends at a suitable angle to the base **14** where it is anchored as indicated at **16**. From the anchor **16**, the thermowire extends directly to ground as indicated at **17** which leads to the battery. Between the anchor **16** and ground **17**, the wire **13** may be provided with resistance coils **18** if such should be needed.

A substantially rigid electrical conductor **19** is secured to the base upon the opposite side of the flipper from the wire **13** and is in electrical connection with a battery terminal or post **20**. This conductor has a bevelled contact button **19***a* at its upper end. Opposite the button **19***a* and upon the opposite side of the flipper, there is a stationary stop **21**. When the wire **13** is cool and contracted, the flipper **7** will be biased toward the right and the bowed portion **8** will be deflected to the right and into contact with button **19***a*. When the thermowire heats and elongates, the flipper under its own tension will move to the left and the bowed portion **8** will snap against stop **21**.

The lower portion of the flipper **7** is connected by a resistance coil **22** to a light bulb terminal **23** upon the base **14**. A core **22***a* in the coil is adapted for attracting an armature **26** constituting a flange on an angle clip **25***a* attached to the base **14** and the pilot light post **24** beneath the base. The angle **25***a* constitutes an electrical conductor with a button **26** on the flange **25** which is flexible and normally biased upwardly. The button is adapted to engage a button **27** on the flipper **7**. When the lights are on, current also passes thru the angle **25***a* to the pilot light posts **24**. If the lights go out, the pilot light will also go out.

The bowed portion of the flipper is provided with a bevelled contact button **8***a* which is adapted to engage the button **19***a* when the thermowire cools and contracts. When these bevelled buttons come into engagement thru the snap action of the bowed portion **8**, there occurs more or less of a wiping action which tends to cleanse the contacts and prevent freezing thereof which results in destructive heating.

In Fig. 6, there is shown a wiring diagram showing a battery **30** from which the current emerges through the conducting wire **31** to a main switch **32** from which the current passes through a wire **31***a* to post **20** connected to

conductor 19 and from which the current passes through the conductor 19 to the contact button 19*a* to contact button 8*a* on the bowed portion 8 of the flipper.

From the button 8*a*, a part of the current will pass directly through the flipper 8 to the contacts 26 and 27 and through the armature 25—25*a* to the post 24 of the pilot light 37. At the same time, current will also flow to the coil 22 and post 23 and to the light 35, from which the current goes to the ground 36. At the same time, a part of the current will also flow from the button 8*a* to the top of the flipper at 12 and through the wire 13 to the anchor post 16 and coil 18 is directly grounded.

In the operation of the switch, the main switch 32 will be closed allowing the current to pass thru the conductor 19 (Fig. 1) to the button 8*a* on the flipper, a part of the current will immediately pass down thru the flipper to the lamp terminal 23 for illuminating the lamps as soon as the switch is closed.

The other part of the current will pass up thru the flipper to the thermo-responsive wire 13 and down thru said wire directly to ground or the battery. When the wire 13 heats and elongates, it will release the tension on the flipper 7 and allow the same to move toward the left and cause the bowed portion 8 to snap or be deflected to the opposite side of the flipper for engaging the stop 21 whereupon the wire will cool and contract and cause the parts to assume the positions shown in Fig. 1.

In the switch involving this invention, the current passing thru the wire 13 to ground and battery constitutes the control current, while the current passing down thru the flipper to the lamps constitutes the load current; the first one may be termed the control circuit and the other the load circuit.

The resistance wire 13 has a predetermined ohmic resistance which remains constant. As a result, the control circuit which is independent of the load circuit will always function to make and break the switch; it will function if there is no lamp load on the load circuit; it will function with several different lamps and any number that may be within the capacity of the battery or source of energy. Thus in having the load current independent of the control current, the latter will always function under different and various lamp loads.

In accordance with this invention, the lights are immediately illuminated when the main switch is closed. This is a very desirable feature. In the second place, the control current will always function to break and make the current irrespective of the lamp load, provided that it is within the capacity of the source of electrical energy. This is an exceedingly desirable feature and a feature which the trade is demanding, since the flasher switches now on the market will not give such a performance. To provide a wiping action at the contacts is very beneficial.

I am aware that many changes may be made and various details of construction may be modified without departing from the spirit and principles of this invention, so I do not propose limiting the patent granted otherwise than necessitated by the appended claims.

I claim:

1. In a flasher switch, an insulated base, a lamp circuit terminal on said base, an upwardly extending electrical current conductive flipper rigidly secured at its lower end on the base in electrical connection with said lamp circuit terminal, said flipper having a bowed deflectable portion, a contact element carried by said bowed portion, a conductor arm secured at its lower end on the base and extending upwardly therefrom in substantially parallel spaced relation to the flipper, a conductor terminal on the base connected to the lower end of the conductor arm, a contact element on the upper portion of the conductor arm and normally engaged by the contact element on the bowed portion of the flipper for establishing a circuit through said flipper to the lamp circuit terminal, a thermo-responsive wire connected at its upper end to the upper end of the flipper and anchored at its lower end on the base, a conductor terminal connected to the lower end of the wire, and a stop for arresting the movement of the bowed portion of the flipper away from the conductor arm in current off position.

2. In a flasher switch, an insulated base, a lamp circuit terminal on said base, an upwardly extending electrical current conductive flipper secured at its lower end on the base in electrical connection with the lamp circuit terminal, said flipper having its upper portion freely movable, a bowed portion carried by the intermediate part of the flipper and adapted to be snapped from one side to the other, a contact element carried by said bowed portion, a conductor arm secured at its lower end on said base and extending upwardly therefrom in substantially parallel relation to the flipper, a conductor terminal on the base connected to the lower end of the conductor arm, a contact element on the upper portion of the conductor arm and normally engaged by the contact element on the bowed portion of the flipper, a single thermo-responsive wire extending between the base and the upper end of the flipper, a conductor terminal connected to the lower end of the wire, and a stop arranged on the side of the flipper opposite to the conductor arm for arresting the movement of the bowed portion of the flipper away from the conductor arm in current off position.

3. In a flasher switch, an insulated base, a current carrying arm extending upwardly from the base, a contact element carried by the upper portion of the arm, a conductor terminal connected to the lower end of the arm, an off circuit stop member arranged in spaced relation to the upper portion of the arm, an electrical conductive flipper secured at its lower end on the base and extending upwardly between the arm and stop member, a conductor terminal connected to the lower end of the flipper, a bowed portion on the upper portion of the flipper, a contact element carried by said bowed portion and normally engaging the contact element on said arm, a single thermo-responsive wire secured at its upper end to the upper free end of the flipper, the lower end of the wire being anchored to the base, a conductor terminal connected to the lower end of the wire, said wire normally biasing the flipper for causing the contact elements to be held in engagement with each other and simultaneously establishing a circuit through the wire and the terminal connected with the lower end of the flipper.

4. In a flasher switch of the character defined in claim 3, wherein the parts are so arranged that upon the heating of the thermo-responsive wire, the latter will be elongated to release the tension of said flipper and cause the bowed portion of the flipper to move and snap against the stop member to break the circuit.

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