April 11, 1950 P. SITZER 2,503,303

ELECTRIC FLASHER

Filed June 26, 1945

FIG. 1

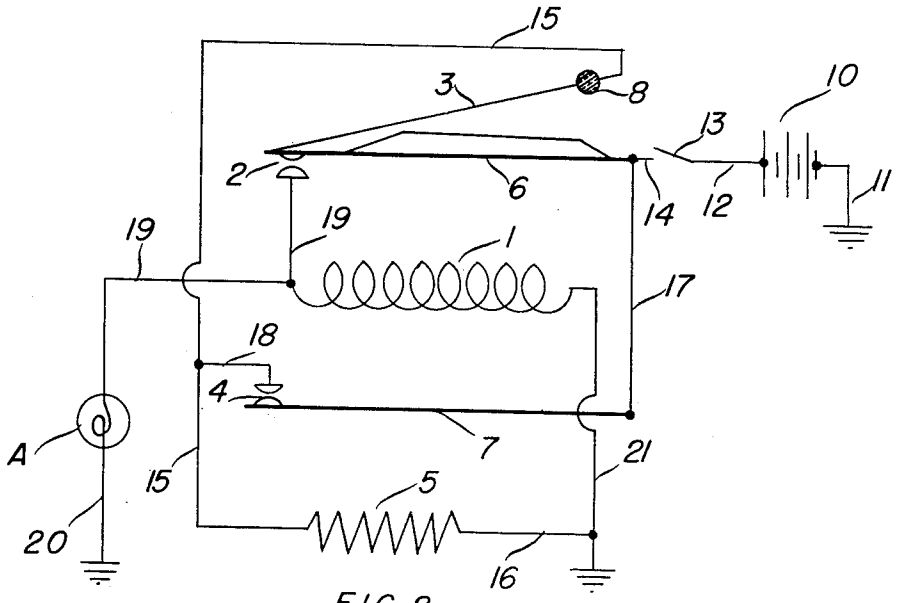
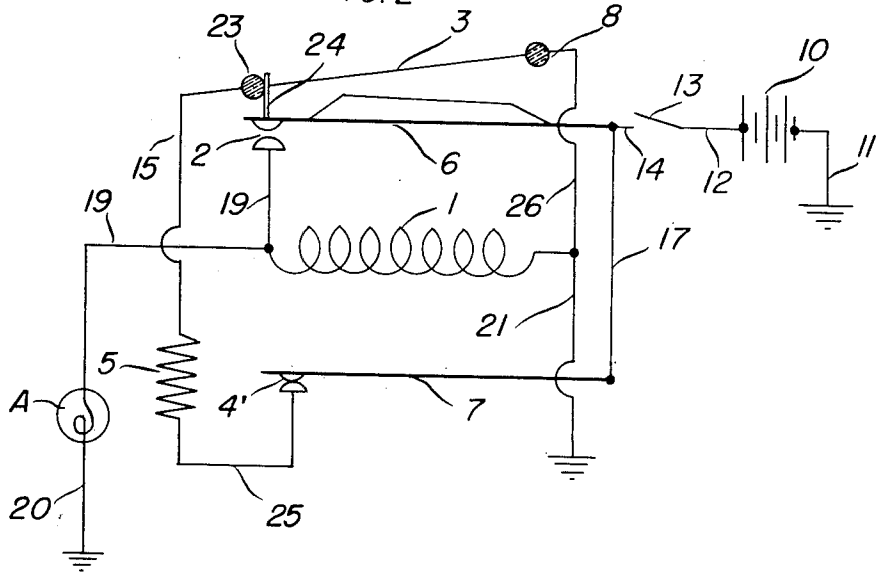


FIG. 2



INVENTOR.
PHILIP SITZER
BY
Bartlett, Eyre, Keel & Weymouth
ATTORNEYS

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ELECTRIC FLASHER

Philip Sitzer, Irvington, N. J., assignor to Tung-Sol Lamp Works Inc.

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3 Claims. (Cl. 200—88)

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This invention relates to electric flashers.

The invention more particularly relates to the thermal magnetic type of flasher heretofore proposed embodying an armature under the joint control of a solenoid and an expansible and contractible pull wire, and one object of the invention is a novel and improved flasher of this type.

The flashers of this type heretofore proposed have one or more of the disadvantages, among others, of either failing to give the required snap action or of being unduly limited as to load capacity or of being impossible to adjust for precision adjustments with changes in load and other objects of the invention are to provide a flasher of the above indicated type which is free of these disadvantages.

A further object of the invention is a flasher which is characterized by its simplicity in construction, its precision operation and its endurance.

Other objects of the invention will hereinafter appear.

For a better understanding of the invention reference may be had to the accompanying drawings showing embodiments of the invention, wherein

Fig. 1 is a diagrammatic illustration of a flasher embodying the invention; and

Fig. 2 is a diagrammatic illustration of another embodiment of the invention.

Referring to Fig. 1, the load to be flashed is indicated at A. The flasher embodies the magnet coil 1, an armature 6 which is magnetically responsive to the coil 1 and a thermally operated pull wire 3 cooperatively functioning with the magnet coil 1 for imparting snap operating actions to the armature 6. This magnet coil 1 may be of any conventional structure and the armature 6 may also be of conventional construction and is constrained so as to have a natural spring actuated tendency to oppose the pull of the wire 3 and to close the contacts 2. The pull of the magnet coil 1 upon the armature 6 is also opposed to the pull wire 3. The pull wire 3 is fastened at the lefthand end to the movable end of the armature 6 and is fastened at the righthand end to an insulating mechanical means 8, as for example a glass bead.

A second armature 7 is diagrammatically illustrated and this armature is also under the influence of the magnet coil 1 and the movable end or part of the armature 7 controls a pair of contacts 4. This armature 7 is constrained so as to have a natural spring actuated tendency to open and hold open the contacts 4 and the coil 1 when

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energized functions to overcome this constraint and close the contacts 4.

A source of electrical energy is illustrated at 10 and the illustration is that of a battery having a connection 11 leading to the ground and a connection 12 leading to a switch 13 which through a connection 14 leads to the armature 6. The righthand end of pull wire 3 is connected by a conductor 15 with a resistance element 5 and the latter is in turn connected through a conductor 16 with the ground. The armature 6 is connected by a conductor 17 with the armature 7 and the stationary contact of the contacts 4 is connected by a conductor 18 with the line 15. The stationary contact of the contacts 2 is connected by a conductor 19 to one terminal of the load A and the other terminal of the load A is connected with the ground through a conductor 20. The magnet coil 1 is connected at the lefthand end with the line 19 and at the righthand end through a conductor 21 with the ground.

The operation of the flasher shown in Fig. 1 is as follows. When the switch 13 is closed current flows from the armature through the pull wire 3, conductor 15, resistance element 5 and conductor 16 to the ground. The energization or heating of the pull wire 3 results in the expansion of the wire and enables the armature 6 to close the contacts 2 to which position the armature 6 is biased by the constraint imposed thereon. Upon closure of the contacts 2 the coil 1 is energized through the circuit armature 6, conductor 19, the coil and conductor 21. At the same time the load A is energized directly through the armature 6 and the conductors 19 and 20. Simultaneously or practically simultaneously the energization of the magnet coil 1 operates the armature 7 against its natural bias to close the contacts 4 and these contacts 4 short-circuit the pull wire 3 and maintain this short circuit until the circuit at contacts 2 through the magnet coil 1 is broken. The breaking of the circuit at the contacts 2 occurs when the wire has cooled to the predetermined degree at which time it overcomes both the natural bias in the armature 6 and the pull of the magnet coil 1 on the armature 6 to open the circuit at the contacts 2. This breaking of the circuit of the contacts 2 is a decidedly snap action under the influence of the pull of the cooling pull wire 3 overcoming the armature bias and the pull of the magnet coil. The deenergization of the magnet coil 1 results in the release of the armature 7 which under its natural bias opens the contacts 4. This completes the first cycle of operations whereupon the cycle is repeated.

In the embodiment of Fig. 2 the pull wire 3 is

insulatedly fastened to the armature 6 through an insulating means 23 as, for example, a glass bead forming a part of an arm or bracket 24 fastened to the lefthand end of the armature 6. Also the armature 7 in this embodiment is biased to close the contacts 4' in the normal or cold position, namely when the magnet coil 1 is de-energized and in this case the current for energizing and heating the wire 3 flows through these contacts 4' and when the coil 1 is energized, the pull wire energizing circuit is interrupted at these contacts 4'. The energizing circuit for the pull wire 3 is from the conductor 14, conductor 17, armature 7, contacts 4', conductor 25, resistance element 5, conductor 15, pull wire 3, conductor 26 and conductor 21. This has the advantage over the embodiment of Fig. 1 in that current energy is dissipated in the resistor element 5 only during a part of the cycle and that there is no dissipation of power in the resistance element 5 during the period that the flasher is in the "on" part of the cycle. Otherwise the operation is similar to that described above with respect to Fig. 1. Upon the closure of the switch 13 the pull wire 3 is energized through the circuit described whereupon due to the heating of the pull wire 3 the bias in the armature 6 closes the contacts 2. This energizes both the magnet coil 1 and the load A connected in multiple and the energization of the magnet coil 1 overcomes the bias of the armature 7 to open the contacts 4' in the pull wire circuit whereupon the cooling wire 3 by virtue of its contraction, and after suitable delay, overcomes the joint action of the armature 6 bias and the pull of the coil 1 to open the contacts 2 with a snap action. The de-energization of the coil 1 in turn results in the reclosure of the pull wire circuit at the contacts 4' with the cycles being repeated.

An important feature of the flasher and circuit of this invention is that the timing of the flasher on both parts of the cycle may be precision preadjusted either with load "on" or load "off" with respect to both the pull wire 3 and the magnet coil 1 and this timing remains fixed wholly irrespective of load variations within the limits of the load capacity. A further advantage is that the load circuit is controlled by the switch or contacts which are operated directly by the pull wire and the magnet coil to obtain the decided snap action desirable. Thus the timing may be precision adjusted in the factory and this precision timing remains in service with any change in the load A within the load capacity of the flasher. As shown in the figures a single load device A is used but this load device A may be multiplied in service without affecting the precision time adjustment previously made and the snap action in breaking the load circuit at the contacts 2 is always present. The pull wire circuit and the magnet coil circuit are both wholly independent of the load circuit and accordingly the variations of the load in service cannot affect the precision timing previously set.

It is understood that the drawings are purposely diagrammatic without any attempt to illustrate either the structure or the relative positioning of the armatures, the magnet coil and the conductors since these form no part of the invention. The armature 6 as above indicated may be of any suitable magnetic spring metal, being constrained to close the contacts 2 when permitted to do so by the pull wires 3. The insulating glass beads 8 may be fused to the pull wire 3 and mounted in a fixed or adjustable support member similarly to the glass bead 48 of Fig. 1 of Schmidinger Patent No. 2,133,309. The glass bead 23 may be fused to the wire 3 and similarly mounted on the arm 24.

I claim:

1. An electric flasher comprising a pair of power supply terminals and at least one other terminal for the connection of a load, an electromagnet, a first armature associated with said magnet and magnetically pulled toward the magnet when the latter is energized, means constraining said armature to supplement the pull of the magnet, a first switch operated by said first armature to close when the armature is moved under the influence of the constraining means, connections between said switch, said terminals and magnet for simultaneous energization of the load and electromagnet in parallel when the switch is closed, a thermal pull wire connected at one end to a fixed support and at the other end to the armature and operable upon contraction to open said switch against the pull of the magnet and the constraining means to provide a snap action opening, a second armature under the influence of said electromagnet and a second switch adapted to be operated by the last mentioned armature when the magnet is energized, and connections between the power supply terminals, said second switch and the pull wire independent of the electromagnet and of the load terminal for alternately energizing and deenergizing the pull wire upon operation of said second switch.

2. An electric flasher comprising a pair of power supply terminals and at least one other terminal for the connection of a load, an electromagnet, a first armature associated with said magnet and magnetically pulled toward the magnet when the latter is energized, means constraining said armature to supplement the pull of the magnet, a first switch operated by said first armature to close when the armature is moved under the influence of the constraining means, connections between said switch, said terminals and magnet for simultaneous energization of the load and electromagnet in parallel when the switch is closed, a thermal pull wire connected at one end to a fixed support and at the other end to the armature and operable upon contraction to open said switch against the pull of the magnet and the constraining means to provide a snap action opening, a second armature under the influence of said electromagnet and a second switch adapted to be operated by the last mentioned armature when the magnet is energized, parallel connections between said second switch and pull wire independent of the electromagnet and of the load terminal, and connections between said second switch and the power supply terminals for alternately energizing and deenergizing the pull wire upon operation of said second switch.

3. An electric flasher comprising a pair of power supply terminals and at least one other terminal for the connection of a load, an electromagnet, a first armature associated with said magnet and magnetically pulled toward the magnet when the latter is energized, means constraining said armature to supplement the pull of the magnet, a first switch operated by said first armature to close when the armature is moved under the influence of the constraining means, connections between said switch, said terminals and magnet for simultaneous energization of the load and electromagnet in parallel when the switch is closed, a thermal pull wire connected at one end to a fixed support and at the other end to the armature and operable upon contraction to open

said switch against the pull of the magnet and the constraining means to provide a snap action opening, a second armature under the influence of said electromagnet and a second switch adapted to be operated by the last mentioned armature when the magnet is energized, and series connections between the power supply terminals, said second switch and the pull wire independent of the electromagnet and of the load terminal for alternately energizing and deenergizing the pull wire upon operation of said second switch.

PHILIP SITZER.

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