Feb. 21, 1967 H. G. SIIBERG 3,305,654

SIGNAL FLASHER HAVING A HEATER MOUNTED ON A MANDRIL SEPARATE FROM, BUT ADJACENT TO THE EXPANSIBLE PULL MEANS

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Fig. 1.

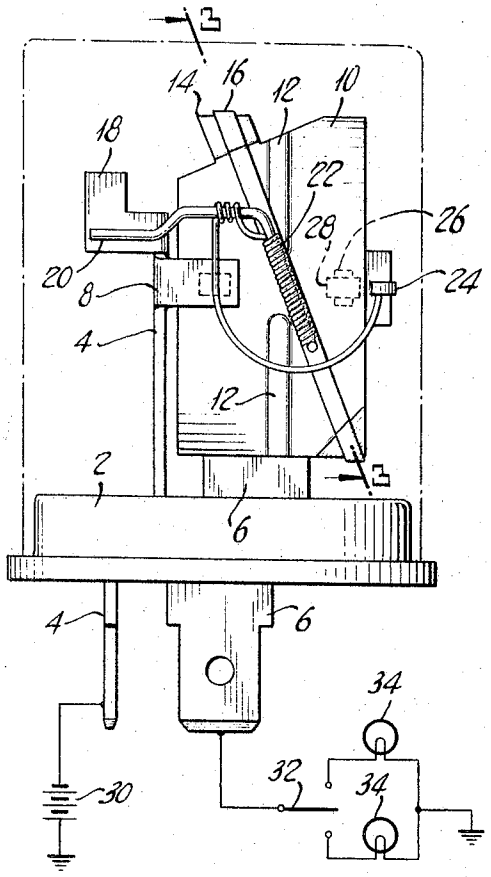


Fig. 3.

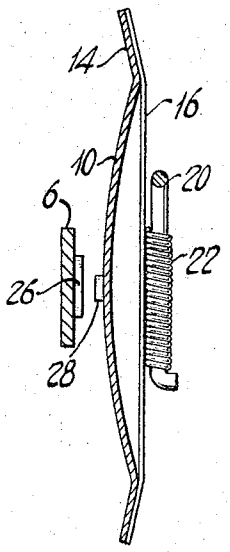


Fig. 4.

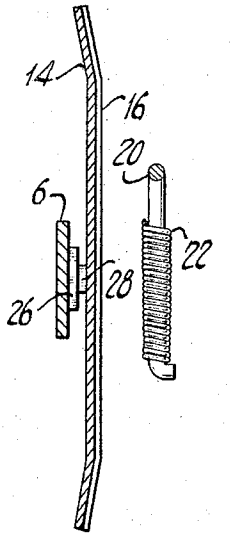
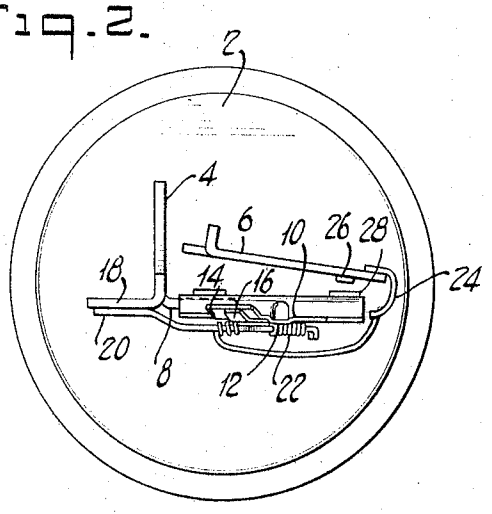


Fig. 2.



INVENTOR
HEMMING G. SIIBERG

BY
Eyre, Mann & Lucas
ATTORNEYS

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SIGNAL FLASHER HAVING A HEATER MOUNTED ON A MANDRIL SEPARATE FROM, BUT ADJACENT TO THE EXPANSIBLE PULL MEANS

Hemming G. Siiberg, Union, N.J., assignor to Tung-Sol Electric Inc., a corporation of Delaware

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The present invention relates to flashers for directional signals and comprises an improved shunt type flasher that is substantially independent of voltage variations and that is adapted for flashing any size lamp load. The new flasher is of the general type in which a vane is held against a bias therein by an expansible pull ribbon which, when heated, expands and permits the vane to assume its constrained shape. Such flasher may be of the series type or of the shunt type. It is well known in the art and is in general commercial use. In the series type flasher the tensioned pull ribbon itself carries the current and the circuit is opened upon expansion of the ribbon whereupon the ribbon cools and contracts and the circuit is again closed, thus intermittently flashing lamps connected in series with the flasher. In the shunt type flasher with which the present invention is concerned the tensioned pull ribbon is heated by a separate heater and the heater, during expansion of the pull ribbon, is in series with the lamp load. Because of the resistance of the heater, there is insufficient current through the circuit to light the lamps. When the ribbon expands, the vane of the flasher snaps to contact closing position, in which position the heater is shunted from the circuit and full current is delivered to the lamp load.

When a heater is wrapped around the pull ribbon the fine insulated heater wire has a relatively short life because of kinks introduced into the heater when it is wound around the pull ribbon. Moreover, as the heater must move with the pull ribbon when the vane snaps from one position to the other, the heater becomes distorted during use and the life of such type flasher is relatively short. In accordance with the present invention the heater wire is not wound about the pull ribbon but is wound around a small mandrel that is fixed in position and aligned with the pull ribbon, the pull ribbon being moved away from the heater by the vane when the ribbon expands. With this arrangement the life of the heater is substantially increased and the temperature of the heater can be made relatively high so that change in voltage will have less effect on the flasher speed than when the heater is physically wound about the pull ribbon. Moreover, because the heater is separate from the flasher, assembly procedure is simpler and adjustment can be more readily effected.

For a better understanding of the invention and of a specific embodiment thereof, reference may be had to the accompanying drawing of which:

FIG. 1 is a front view, with the cover removed, of a flasher embodying the invention;

FIG. 2 is a top plan view of the flasher of FIG. 1;

FIG. 3 is a vertical sectional view on an enlarged scale taken on the line 3—3 of FIG. 1 showing the position of the parts when the pull ribbon is cold; and

FIG. 4 is a view similar to FIG. 3 but showing the position of the parts when the pull ribbon is hot.

Referring to the drawings, the flasher shown therein comprises a base 2 of plastic material through which extend metallic members 4 and 6. Below the base 2, the members 4 and 6 comprise prong terminals of the flasher. Above the base 2, the members 4 and 6 comprise support elements for the flasher. Member 4 above the base 2 carries a tab 8 for support of a resilient vane 10, the vane, adjacent one edge thereof, being welded to the tab. The vane 10 is generally rectangular and has impressed therein a pair of ribs 12 along the vertical central line, the ribs 12 tending to bow the vane convexly about the vertical axis as viewed in FIG. 1. The upper left hand corner of the vane 10 is cut away except for a slight portion 14 to which one end of the pull ribbon 16 is welded. The other end of the pull ribbon 16 is welded to the lower right hand corner of the vane. The tab or portion 14 serves as an adjustable ear for tensioning the pull ribbon 16. When the ribbon is cold, it bows the vane concavely about the horizontal axis against the bias introduced by the ribs 12. In snapping from the configuration wherein the vane is bowed concavely about a horizontal axis (pull ribbon cold) to the configuration wherein it is curved convexly about the vertical axis (pull ribbon hot) the vane pivots about the area of connection to the tab 8.

Above the tab 8 on the member 4 there is an outstanding portion 18 upon which is mounted a mandrel 20 of round or oval cross section as shown in FIGS. 3 and 4. The mandrel extends horizontally from the portion 18 to a point adjacent the pull ribbon 16 and then extends diagonally downward parallel to the pull ribbon. Wrapped about the mandrel 20 is a heater 22 of fine wire provided with a thin insulating coating. One end of the heater is electrically connected to the end of the mandrel 20 and the other end of the heater is electrically connected to a finger 24 extending from the member 6. The member 6 also carries a fixed contact 26 in alignment with a contact 28 mounted on the vane 10 and out of engagement therewith when the pull ribbon is cold.

In use, the prong terminal portion of member 4, as shown diagrammatically in FIG. 1, is connected to the positive terminal of a battery 30 which can be and preferably is the car carried battery of nominally 12 volts. The prong terminal portion of member 6 is connected through the conventional signal switch 32 to the lamp loads 34 to be flashed. With the above described arrangement, when the switch 32 is closed to flash a bank of lamps, current flows from the battery through member 4, the mandrel 20, heater 22 to finger 24, member 6 and switch 32 to the lamps. This current, because of the inclusion of the resistance of the heater 22 in the circuit is insufficient to light the lamps. The heater, however, heats the pull ribbon 16 and causes expansion of the pull ribbon. When the tension in the pull ribbon decreases due to the expansion thereof, the vane snaps toward the position to which it is biased by the ribs 12 bringing contact 28 into engagement with contact 26. Accordingly, the heater 22 is shunted from the circuit and the full battery voltage is delivered to the lamps. The circuit now is from battery 30 to member 4, the vane 10, contacts 26 and 28 to member 6, switch 32 and the lamp load. With the heater 22 shunted the pull ribbon starts to cool and contract and eventually snaps the vane back into the position in which the contacts 26 and 28 are separated, thus re-inserting the heater in the circuit. The cycle continues so long as switch 32 is closed.

As the ribbon, while it is cooling, is spaced away from the heater, the temperature of the heater will have little, if any, effect upon the rate of cooling of the ribbon. Consequently, variations in voltage of the supply will not affect the cooling rate. Also the heating time of the heater is designed to be faster than the time it takes to expand the ribbon due to heat transfer. Thus change in voltage on the heater produces almost no change in heating time. Consequently as both heating time and cooling time remains constant with change in voltage, the ratio remains constant as does the rate of flashing.

FIGS. 3 and 4 illustrate the movement of the pull ribbon with respect to the mandrel upon which the heater is wound. In FIG. 3 the pull ribbon is substantially adjacent to the heater and the contacts 27 and 28 are separated. In FIG. 4 the vane has snapped to contact clos-

ing position and the ribbon is spaced from the heater and is cooling.

The invention has now been described with reference to a single embodiment. Obviously the particular shape of vane, the orientation of the pull ribbon with respect to the ribs or other means for biasing the vane could be changed without departing from the invention. It is the fixed mounting of the heater on a cylindrical mandrel of round or oval cross section which provides the advantages thereinabove described. In addition, the fixedly mounted heater is advantageous from the assembly point of view as it simplifies the assembly and permits adjustment of the spacing of the heater from the pull ribbon without interfering with adjustment of the vane and tension of the pull ribbon.

The following is claimed:

1. In a shunt type flasher of the type wherein a resilient vane having a linear deformation therein has expansible pull means secured under tension thereto which when cold holds the vane in one circuit controlling position and when heated permits the vane to snap to a second circuit controlling position, the combination comprising a fixed support means for the vane about which the vane pivots when snapping from one circuit controlling position to the other, a mandrel fixedly mounted with respect to said support means and extending parallel to the expansible pull means and adjacent thereto when the vane is in said first controlling position, said vane when snapping to said second controlling position laterally moving said pull means away from said mandrel, an electrical heater insulatedly wound about said mandrel and circuit means for energizing said heater to heat said pull means only when the vane is in said first circuit controlling position whereby when said heater is energized it is adjacent said pull means and when it is deenergized and cooling it is spaced from said pull means.

2. A shunt type flasher comprising a pair of spaced fixed support members, a resilient vane mounted on one of said members, said vane having a linear deformation therein biasing the vane toward one circuit controlling configuration, an expansible pull means secured under tension at its ends to the vane and when cold holding said vane against the bias therein in a second circuit controlling configuration, said vane pivoting about its point of attachment to said one of said support members when snapping between said two configurations with change in tension in said pull means, a mandrel fixedly secured at one end to said one support and having a portion extending parallel to the pull means, said pull means when cold, being adjacent to said mandrel and being laterally moved away from said mandrel by said vane when snapping to the configuration toward which it is biased by said linear deformation, a heater wire insulatedly wound about said portion of the mandrel and electrically connected between said two support members, a fixed contact mounted on said other support member and a contact mounted on said vane and positioned to engage said fixed contact when the vane is in the configuration toward which it is biased by the deformation therein, whereby, when a source of energy and a lamp load are connected across said fixed support members the heater is energized and heats the pull means which expand and permit the vane to snap to contact closing configuration, shunting the heater and causing the lamp load to come to full brilliance whereupon the pull means cools, snaps the vane to contact open configuration and re-energizes the heater for repetition of the flashing cycle.

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BERNARD A. GILHEANY, *Primary Examiner.*

T. MACBLAIN, H. A. LEWITTER, *Assistant Examiners.*