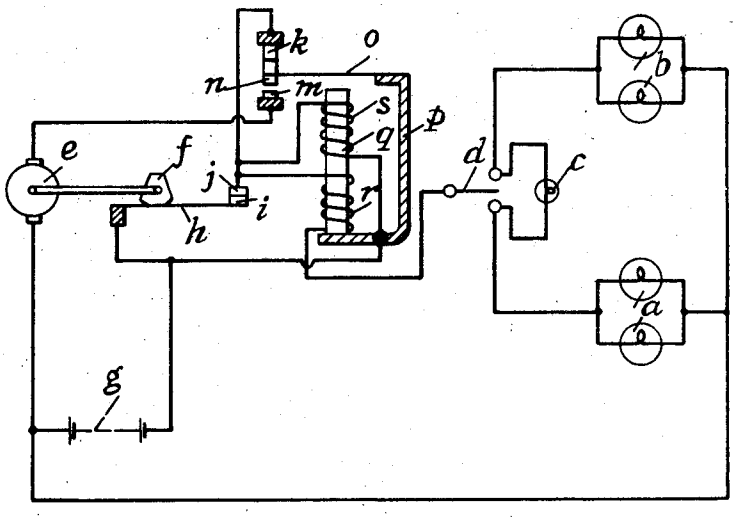
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MEANS FOR ACTUATING ROAD VEHICLE DIRECTION INDICATORS OF THE FLASHING TYPE

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MEANS FOR ACTUATING ROAD VEHICLE DIRECTION INDICATORS OF THE FLASHING TYPE

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This invention relates to apparatus for actuating road vehicle direction indicators of the flashing type, the said means being of the kind in which an electric lamp circuit is controlled by intermittent actuation of a switch through the medium of a rotary cam driven by an electric motor.

The object of the invention is to provide an apparatus in a form which ensures that the electric motor shall be rendered inoperative in the event of failure of any of the signal lamps.

An apparatus in accordance with the invention comprises a motor-operable switch for controlling the lamp circuits, a two-position switch for controlling the motor, and an electromagnet provided with a pair of windings respectively arranged in parallel and in series with the motor-operable switch for actuating the motor-controlling switch, the motor-operable switch being adapted when in one of its positions to short-circuit the parallel winding of the electromagnet, and the apparatus being adapted to operate as hereinafter described.

The invention further comprises a system which includes an apparatus as defined in the preceding paragraph, two associated signal lamp circuits each containing two lamps in parallel, a warning lamp, a manually operable selector switch, and a rotary motor-operable cam for actuating the motor-operable switch.

The accompanying drawing illustrates diagrammatically an apparatus and system in accordance with the invention.

Referring to the drawing, the system there shown includes a circuit for the right-hand signalling lamps *a*, and a parallel circuit for the left-hand signalling lamps *b*, and each such circuit is divided to form two parallel branches which respectively include a lamp visible at the front of the vehicle and a lamp visible at the rear of the vehicle. The right and left hand lamp circuits are interconnected by a branch circuit which includes a warning lamp *c* mounted in a position visible to the driver, the latter lamp requiring a smaller current than the signalling lamps. The said circuits are controlled by a manually-operable selector switch *d* whereby either the right-hand or left-hand lamps can be brought into action. Also in parallel with the signalling lamp circuits is arranged a circuit which includes an electric motor *e* which serves to rotate a cam *f* either directly or through speed reduction gearing. At one end the lamp and motor circuits are connected to one end of a current-supply battery *g*. The other end may be earthed or connected as shown to the other end of the battery.

The signalling lamp and motor circuits are controlled by an apparatus which includes a switch operable by the cam *f*. This switch in the form shown comprises a spring, or spring-loaded, blade *h* carrying a contact piece *i* which co-operates with a fixed contact piece *j*. Separation of the contact pieces is effected by the action of the cam on the said blade, and closing of the contacts is effected by the resiliency of the blade or by a spring acting on the blade. This switch controls the supply of

current to the lamps from the battery. The said apparatus also includes a two-position switch comprising fixed contact pieces *k*, *m* and an intermediate movable contact piece *n* carried by a spring, or spring loaded, blade *o*. At one end the blade is anchored to an iron part *p* on which is formed or secured the core *q* of an electromagnet, which serves by its action on the blade *o* to move the contact piece *n* into contact with the contact piece *m*. This switch serves to control the motor circuit.

On the core *q* of the electromagnet are mounted two windings *r*, *s*. The winding *r* is connected in series with the signalling lamps, the switch *d* and the battery through the contact pieces *i*, *j* of the motor-operable switch. The other winding *s* is connected in parallel with the said contact pieces *i*, *j*. Further the winding *r* is so designed that when a normal current flows through both of the signalling lamps *a* or *b*, the resulting magnetic flux in the core is sufficient to effect movement of the switch blade *o* to the position in which it closes the motor circuit.

The manner in which the various parts of the system are interconnected will be readily ascertained by inspection of the drawing.

The mode of action of the system is as follows:

When the system is not in action the manually operable selector switch and the motor-controlling switch occupy the positions shown. The motor-operable switch may be closed, as shown, or it may be open, the condition of this switch depending on the rest-position of the cam. To bring either of the pairs of lamps *a*, *b* into action, the driver moves the switch *d* to the appropriate position. Current can then flow from the battery through the lamps and the electromagnet winding *r* and so cause the switch blade *o* to be moved to the position in which it closes the motor circuit and thereby causes the motor to be set in motion for actuating the blade *h* of the lamp controlling switch. At the same time a relatively small current can also flow through the warning lamp *c*.

When the contacts *i*, *j* are closed the lamp current passes through only the winding *r*. But when these contacts are separated, the lamp current passes through both of the windings, *r*, *s* and due to the resistance of the winding *s*, the lamp current is sufficiently reduced to effect virtual extinction of the light given by the lamps. The blade *o* is however, still held by the electromagnet, as the joint actions of the diminished current in the two windings is sufficient to prevent release of the blade. Consequently by intermittent opening and closing of the contact pieces *i*, *j* under the action of the cam *f*, the lamp current is caused to fluctuate and so cause the lamps to give the desired light flashes. The warning lamp *c* also gives corresponding flashes and so announces to the driver that the system is operating normally.

In the event of failure of either of the lamps *a*, or *b*, the current which then flows through the winding *r* is then inadequate to hold the switch blade *o*, and the latter then reverts to the position shown, and causes the motor to be brought to rest. In this condition the warning lamp *c* gives a steady light, and so announces to the driver that the system is not working properly.

Cessation of the signalling action results and the motor is brought to rest when the driver returns the switch *d* to its "off" position.

By this invention reliable control of a flashing signal lamp system of the kind specified is ensured in a very simple manner.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A road vehicle signalling device of the flashing type comprising in combination a pair of electric lamp circuits connected in parallel, an electric current-supply circuit, a manually operable selector switch for alter-

natively connecting the lamp circuits to the current-supply circuit, interrupter-switch means in the current supply circuit, an electric motor, rotary cam means operable by the electric motor for intermittently actuating the interrupter-switch means, an electromagnet, and switch means operable by the electromagnet for controlling the supply of current to the motor, the electromagnet having a winding in series with the interrupter-switch means and the selector switch, and a second winding which is in parallel with and short-circuited by the interrupter-switch means when the latter is closed, but which is brought into action, when the interrupter-switch means is opened, to reduce the current supply to either of the lamp circuits depending on the position of the selector switch.

2. A road vehicle signalling device according to claim 1, in which the two windings of the electromagnet are in series with each other when the interrupter-switch means is open.

3. A road vehicle signalling device according to claim 1, and having a branch circuit interconnecting the lamp circuits, and a warning lamp in the branch circuit.

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