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AUTOMOTIVE SIGNALLING CIRCUITS AND SWITCH THEREFOR

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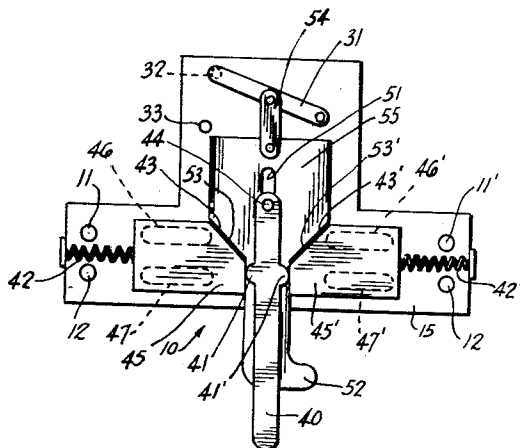


Fig. 1.

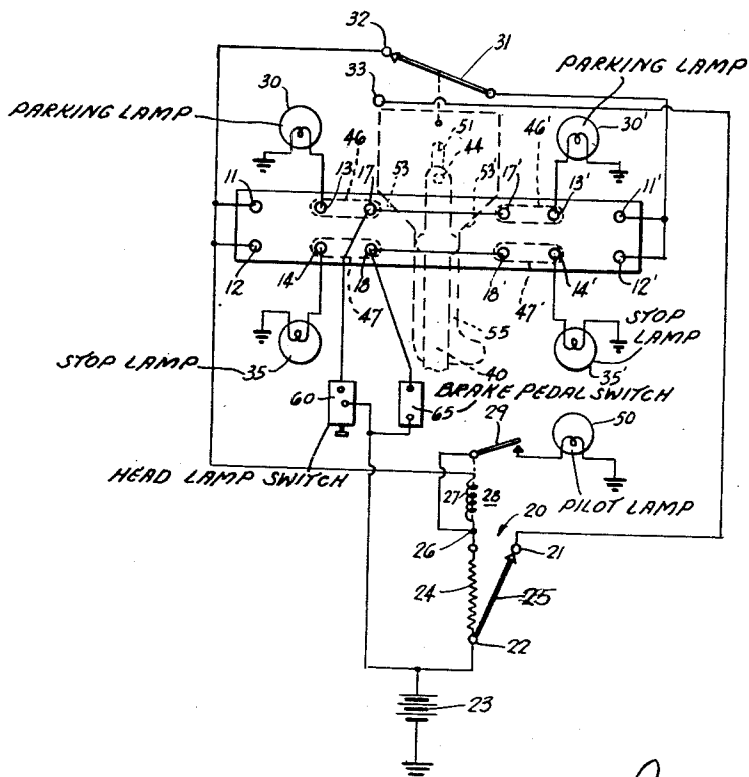


Fig. 2.

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AUTOMOTIVE SIGNALLING CIRCUITS AND SWITCH THEREFOR

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9 Claims. (Cl. 340—81)

This invention relates to signal lamp circuits for motor vehicles and, more particularly, to a novel directional signalling switch in combination with a novel signal lamp and flasher circuit.

Modern motor vehicles are equipped with two pairs of lamps for signalling changes in direction, one pair being mounted on either side of the front of the vehicle and the other pair on either side of the rear of the vehicle. A selector switch is provided to selectively energize both left lamps or both right lamps, preferably in circuit with a flasher to "flash" the selectively illuminated lamps.

The flasher generally includes a resistance wire which is always in circuit and which is periodically shunted by operation of a movable switch arm responsive to heating of the resistance wire. This arm makes alternate contact with two terminals. When the resistance wire is not shunted, its high resistance prevents any effective current flow to the signal lamps, so that the lamps are energized only when the resistance wire is shunted by the movable flasher arm. When the latter shunts the resistance wire, the wire cools and the flasher arm disengages the shunting contact.

When the flasher arm disengages the shunt contact, it is engaged with a terminal or contact which, for convenience, will be termed the "dead" contact to distinguish from the "shunt" contact and the "live" contact connected to the vehicle battery or generator.

In accordance with the present invention, a novel selector switch is provided, in combination with a novel circuit arrangement including a flasher, to selectively flash either the left parking and stop lamps or the right parking and stop lamps, to indicate a proposed change in vehicle direction of movement, or to alternately flash the left lamps and right lamps to give warning of an emergency stop or emergency parking, as to make repairs or to change a tire.

To this end, the switch includes a base having six pairs of contacts or terminals thereon, three on each side of an operating lever pivoted to the base. The operating lever has a pair of slides spring biased against either side thereof and normally each overlying a pair of inner contacts and a pair of intermediate contacts, each slide having a pair of contact strips each connecting an inner contact to an intermediate contact. When the operating lever is swung in either direction, one slide is moved outwardly so that each of its contact strips connects an intermediate contact to an outer contact, the strips disengaging the inner contacts.

The inner ends of the slides are formed with cam surfaces for engagement with a cam member movable transversely of the base to simultaneously move both slides to the outer position. A switch arm is pivoted on the base and linked to the cam member. This switch arm, in the normal position of the cam member, engages a first contact and, the operated position of the cam member, engages a second contact.

Each parking lamp is connected to the "front" contact of an intermediate pair and each stop lamp is connected to the "rear" contact of an intermediate pair. The "front" contacts of the two inner pairs are connected to the parking lamp tap of the headlamp control switch, and the "rear" contacts to the stop lamp control switch. The contacts of one outer pair are connected to the shunt contact of the flasher, the latter having its live contact connected to the potential source. The other pair of outer contacts are connected to the first mentioned pair through the switch arm and its normally engaged first

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contact. The second contact of the switch arm is connected to the dead contact of the flasher. A pilot lamp, and an operating relay therefor, are also connected to the shunt contact of the flasher.

With the thus described arrangement, the two slides normally connect the parking and stop lamps for operation by their respective control switches. When the swingable operating lever is swung in one direction, one slide is moved to connect the left parking and stop lamps, for example, to the flasher, the right lamps remaining connected to their control switches. The left lamps are thus "flashed," the pilot lamp flashing in synchronism therewith. The relay is so designed that it will receive sufficient operating current only when the parking and stop lamps are both drawing current, so that the pilot lamp will signal a failure of either lamp.

When the cam member is operated, both slides are moved outwardly and the switch arm is engaged with its second contact. One set of parking and stop lamps is thus connected to the shunt terminal of the flasher and the other to the dead terminal thereof. As the flasher arm alternately engages these two contacts, the left and right lights are alternately flashed, indicating an emergency stop.

For an understanding of the invention principles, reference is made to the following description of a typical embodiment thereof as illustrated in the accompanying drawing. In the drawing:

Fig. 1 is a somewhat diagrammatic plan view of a switch embodying the invention; and

Fig. 2 is a schematic wiring diagram of the invention signalling system, only the base and contacts of the switch being shown in full.

Referring to the drawing, the switch 10 of the invention is shown as including a base 15 having contacts or terminals 11—14, 17 and 18, and 11'—14', 17' and 18' thereon. Outer contacts 11, 12 are connected to the first or "shunt" contact 26 of a reciprocating switch as a flasher 20 having a live contact 22 connected to the live terminal of a grounded battery 23. A resistance heating wire 24, of "Nichrome" or the like, is connected between live contact 22 and shunt contact 26. Switch terminals 11, 12 are connected to shunt contact 26 through the operating coil 27 of a relay 28 having normally open contacts 29 connected to shunt contact 26 and a grounded pilot lamp 50.

Flasher 20 includes a movable arm electrically connected to live terminal 22 and normally engaging a second or "dead" contact 21. When wire 24 is heated by current flow therethrough, it expands to swing arm 25 into engagement with shunt contact 26. This shunts wire 24, which latter cools and contracts to engage arm 25 with dead contact 21.

A movable switch arm 31 is pivoted on base 15 and normally engages a first contact 32 connected to outer terminals 11 and 12. In this position, arm 31 connects outer terminals 11 and 12 to outer terminals 11' and 12'. When switch arm 31 is swung, as hereinafter described, arm 31 engages a second contact 33 connected to dead contact 21 of flasher 20.

Intermediate terminals 13 and 14 are respectively connected to grounded left parking lamp 30 and grounded left stop lamp 35. Intermediate terminals 13' and 14' are similarly connected to right parking lamp 30' and right stop lamp 35'.

Inner terminals 17, 17' are interconnected to the parking lamp tap of a head lamp control switch 60, and inner terminals 18, 18' are interconnected to stop lamp control switch 65, both these switches being connected to battery 23. Contacts 11, 11' and 12, 12' constitute pairs of outer contacts or terminals, contacts 13, 13' and 14, 14' constitute pairs of intermediate contacts or terminals, and contacts 17, 17' and 18, 18' constitute pairs of inner contacts or terminals.

An operating lever 40, constituting a first operating means, is pivoted at 44 on base 15, and has abutments 41, 41' respectively engaging the inner ends of slides 45, 45' biased toward lever 40 by springs 42, 42'. For a purpose to be described, the "front" inner corners 43, 43' of the slides are bevelled or chamfered.

Slide 45 carries contact strips 46, 47 on its underside,

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slide 45' having similar contact strips 46', 47'. Strip 46 is aligned with contacts 11, 13, 17, and strip 47 with contacts 12, 14, 18. Strips 46' and 47' are similarly arranged. In the off position of switch 10, the contacts each connect an inner terminal to an intermediate terminal whereas, in the operated position of either slide, its contacts each connect an intermediate terminal to an outer terminal.

The cam member, or second operating means for operating both slides simultaneously comprises a pull handle 55 having a slot 51 receiving the pivot pin 44, and having a finger hook 52. Cam member 55 is guided by the two slides and has bevelled shoulders 53, 53' engaging the bevelled or cam surfaces 43, 43' of the slides. A link 54 connects arm member 55 to switch arm 31, so that cam 31 is disengaged from contact 32 and engaged with contact 33 each time member 55 is drawn outwardly.

The operation of the arrangement will be clear from the following. To signal a left turn, handle or lever 40 is swung clockwise. This moves slide 45 outwardly so that contact strip 46 connects terminals 11 and 13, and contact strip 47 connects contacts 12 and 14. Left lamps 30 and 35 are thus connected to shunt contact 26 of flasher 20. The resistance of wire 24 is sufficiently high that the lamps do not receive sufficient current to be operated.

As wire 24 is heated, arm 25 is swung to engage contact 26, shunting wire 24. Current flows through coil 27 and lamps 30, 35 in sufficient amount to close contacts 29, to illuminate pilot lamp 50, and to illuminate lamps 30 and 35. Should either lamp 30 or 35 be burned out, the current flow through coil 27 will be insufficient to close contacts 29 and pilot lamp 50 will not be illuminated. This indicates that a lamp 30 or 35 is burned out or has a circuit break.

When wire 24 is shunted, it cools. Arm 25 swings back to engage dead contact 21, breaking the lamp energizing circuit. Wire 24 again heats to repeat the cycle, so that lamps 30, 35 and 50 are periodically flashed. Movement of lever 40 to indicate a right turn effects a similar operation of lamps 30', 35' and 50.

To signal an emergency stop or parking, cam member 55 is pulled. This moves both slides outwardly simultaneously, by the action of shoulders 53, 53' or surfaces 43, 43'. Simultaneously, switch arm 31 is pulled to engage contact 33. Lamps 30 and 35 are now connected to flasher contact 26, and lamps 30' and 35' are connected to contact 21 through switch arm 31 and contact 33.

Lamps 30' and 35' are immediately illuminated. As wire 24 is heated, arm 25 disengages contact 21, extinguishing lamps 30', 35', and engages contact 26 to shunt wire 24 and illuminate lamps 30, 35 and 50. The left and right lamps are thus flashed in alternation. Only two lamps draw current through each contact 21, 26, thus prolonging the contact life.

Although the embodiment illustrated in the drawing and outlined in the specification utilizes the standard parking lamps and stop lamps of a vehicle normally supplied therewith by the manufacturer, it is within the province of this invention to apply a separate set of signal lamps to function in accordance with the purpose of this invention, while maintaining the parking lamps and stop lamps to function in their normal capacity.

While a specific embodiment of the invention has been shown and described to illustrate the application of the invention principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A motor vehicle directional switch arrangement comprising, in combination, a base having a pair of outer terminals and a pair of intermediate terminals, first operating means mounted on said base and selectively operable to connect either outer terminal to an intermediate terminal, second operating means mounted on said base and selectively operable to connect both outer terminals simultaneously to the associated intermediate terminals, a switch arm movably mounted on said base and selectively engageable with a first contact or a second contact, said arm normally engaging said first contact, means interconnecting said arm to said second operating means to engage said second contact when said second operating means is operated, means connecting the respective intermediate terminals to signal lamps on

opposite sides of the vehicle, a reciprocating switch including first and second terminals and means alternately connecting said first and second terminals to a source of potential, means connecting one outer terminal to said first contact and to said first terminal, means connecting the other outer terminal to said switch arm, and means connecting said second contact to said second terminal, whereby, when said first operating means is operated, the lamps on a selected side of the vehicle will be flashed, and when said second operating means is operated, the lamps on opposite sides of the vehicle will be alternately flashed.

2. A motor vehicle directional switch arrangement comprising, in combination, a base having a pair of outer terminals and a pair of intermediate terminals, first operating means mounted on said base and selectively operable to connect either outer terminal to an intermediate terminal, second operating means mounted on said base and selectively operable to connect both outer terminals simultaneously to the associated intermediate terminals, a switch arm movably mounted on said base and selectively engageable with a first contact or a second contact, said arm normally engaging said first contact, means interconnecting said arm to said second operating means to engage said second contact when said second operating means is operated, means connecting the respective intermediate terminals to signal lamps on opposite sides of the vehicle, a flasher having a live terminal, connected to a source of potential, a shunt terminal, a dead terminal, a resistance connecting said live and shunt terminals, and an operating arm connected to said live terminal and normally engaging said shunt terminal, and operable by said resistance, when the latter is heated, to engage said shunt terminal to shunt said resistance, means connecting one outer terminal to said first contact and to said shunt terminal, means connecting the other outer terminal to said switch arm, and means connecting said second contact to said dead terminal, whereby, when said first operating means is operated, the lamps on a selected side of the vehicle will be flashed, and when said second operating means is operated, the lamps on opposite sides of the vehicle will be alternately flashed.

3. A motor vehicle directional switch arrangement comprising, in combination, a base having a pair of outer terminals and a pair of intermediate terminals, an operating lever pivotally mounted on said base between the intermediate terminals, a pair of slides movably mounted on said base on either side of said lever and each carrying a contact strip aligned with an intermediate and outer terminal, means biasing said slides to engage said lever with said strips engaging only the intermediate terminals, cam means movably mounted on said base for linear movement and selectively operable to move both slides outwardly simultaneously to connect each outer terminal to an intermediate terminal, a switch arm movably mounted on said base and selectively engageable with a first contact or a second contact, said arm normally engaging said first contact, a link interconnecting said arm to said cam means to engage said second contact when said cam means is operated, means connecting the respective intermediate terminals to signal lamps on opposite sides of the vehicle, a reciprocating switch including first and second terminals and means alternately connecting said first and second terminals to a source of potential, means connecting one outer terminal to said first contact and to said first terminal, means connecting the other outer terminal to said switch arm, and means connecting said second contact to said second terminal.

4. A motor vehicle directional switch arrangement comprising, in combination, a base having two pairs of outer terminals, two pairs of inner terminals, and two pairs of intermediate terminals, an operating lever pivotally mounted on said base between the two pairs of inner terminals, a pair of slides movably mounted on said base on either side of said lever and each carrying a pair of contact strips each aligned with an intermediate and outer terminal, means biasing said slides to engage said lever with said strips engaging only the intermediate terminals, and inner terminals, cam means movably mounted on said base between said slides and selectively operable to move both slides outwardly simultaneously to connect each outer terminal to an intermediate terminal, a switch arm movably mounted on said base and selectively engageable with a first contact or a second

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contact, said arm normally engaging said first contact, a link interconnecting said arm to said cam means to engage said second contact when said cam means is operated, a parking lamp control switch, a stop lamp control switch, means connecting one terminal of each inner pair to said parking lamp control switch, means connecting the other terminal of each inner pair to said stop lamp control switch, means connecting one terminal of each intermediate pair to a parking lamp on opposite sides of the vehicle, means connecting the other terminal of each intermediate pair to a stop lamp on opposite sides of the vehicle, a reciprocating switch including first and second terminals and means alternately connecting said first and second terminals to a source of potential, means connecting one outer terminal to said first contact and to said first terminal, means connecting the other outer terminal to said switch arm, and means connecting said second contact to said second terminal.

5. An arrangement as claimed in claim 4, including a pilot lamp and a relay having an operating coil connected in series between said first terminal and said first pair of outer terminals and normally open contacts arranged to connect said pilot lamp to said first terminal, said operating coil receiving sufficient operating current only when both a parking lamp and a stop lamp are simultaneously illuminated.

6. A motor vehicle signalling switch arrangement comprising, in combination, a flasher having a live terminal connected to a source of potential, a shunt terminal, a dead terminal, a resistance connecting said live and shunt terminals, an operating arm connected to said live terminal and normally engaging said dead terminal and operable by said resistance, when the latter is heated, to engage said shunt terminal to shunt said resistance; means, including a first switch operator, selectively operable to connect signal lamps on either side of the vehicle to the shunt terminal of said flasher; and means, including a second switch operator, selectively operable to simultaneously connect the signal lamps on one side of the vehicle to said shunt terminal and the signal lamps on the other side of said vehicle to said dead terminal.

7. A motor vehicle directional switch comprising, in combination, a base having outer terminals and intermediate terminals, an operating lever pivotally mounted on said base between the intermediate terminals and having an abutment on each side thereof, a pair of slides movably mounted on the base on either side of said lever and each carrying contact strips each aligned with an outer terminal and an intermediate terminal, means biasing said slides to engage the abutments of said lever with said strips engaging only the intermediate terminals, said lever being selectively swingable to move a slide

outwardly to electrically interconnect an outer and intermediate terminal by a contact strip, each slide having a cam surface on its inner edge, and cam means movably mounted on said base and engageable simultaneously with both cam surfaces to move both slides outwardly.

8. A motor vehicle directional switch comprising, in combination, a base having outer terminals and intermediate terminals, an operating lever pivotally mounted on said base between the intermediate terminals and having an abutment on each side thereof, a pair of slides movably mounted on the base on either side of said lever and each carrying contact strips each aligned with an outer terminal and an intermediate terminal, means biasing said slides to engage the abutments of said lever with said strips engaging only the intermediate terminals, said lever being selectively swingable to move a slide outwardly to electrically interconnect an outer and intermediate terminal by a contact strip, each slide having a cam surface on its inner edge, and a pull lever movably mounted on said base between said slides and having cam means engageable simultaneously with both cam surfaces to move both slides outwardly.

9. A motor vehicle directional switch comprising, in combination, a base having outer terminals and intermediate terminals, an operating lever pivotally mounted on said base between the intermediate terminals and having an abutment on each side thereof, a pair of slides movably mounted on the base on either side of said lever and each carrying contact strips each aligned with an outer terminal and an intermediate terminal, means biasing said slides to engage the abutments of said lever with said strips engaging only the intermediate terminals, said lever being selectively swingable to move a slide outwardly to electrically interconnect an outer and intermediate terminal by a contact strip, each slide having a cam surface on its inner edge, and a pull lever movably mounted on said base between said slides and having cam means engageable simultaneously with both cam surfaces to move both sides outwardly, said pull lever having an elongated slot receiving the pivot of said operating lever.

References Cited in the file of this patent

UNITED STATES PATENTS

2,122,508	Bell	July 5, 1938
2,238,394	Murray	Apr. 15, 1941
2,258,747	Doane	Oct. 14, 1941
2,300,896	Hosmer	Nov. 3, 1942
2,358,332	Kennett	Sept. 12, 1944
2,462,495	Harrison	Feb. 22, 1949
2,652,553	Hollins	Feb. 15, 1953