Jan. 19, 1943. A. A. BLUEMLE ET AL 2,309,039

LIGHTING SYSTEM

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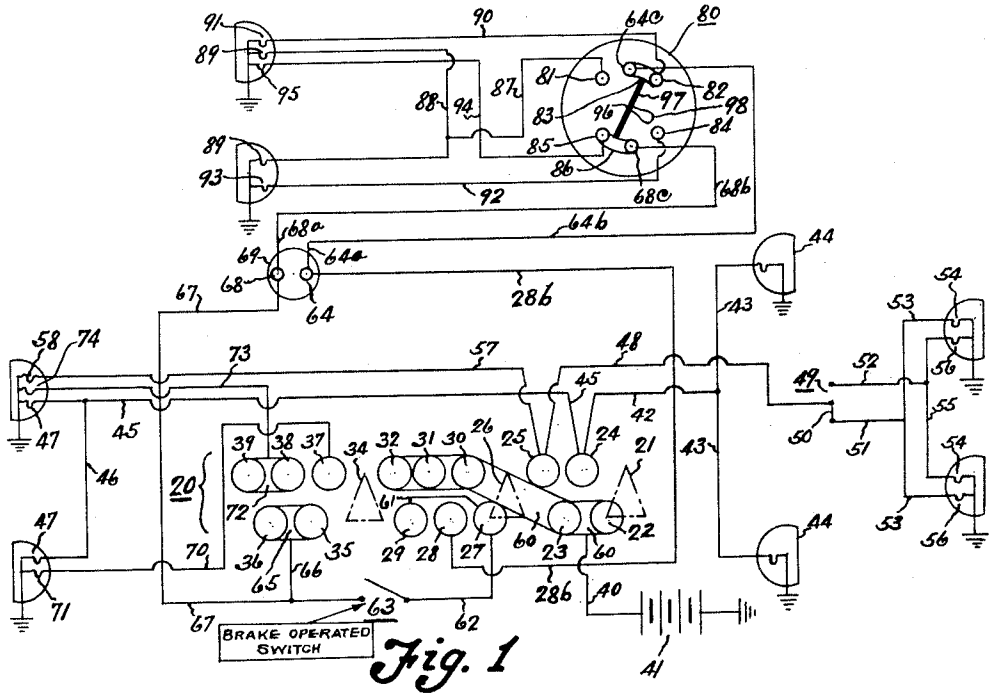


Fig. 1

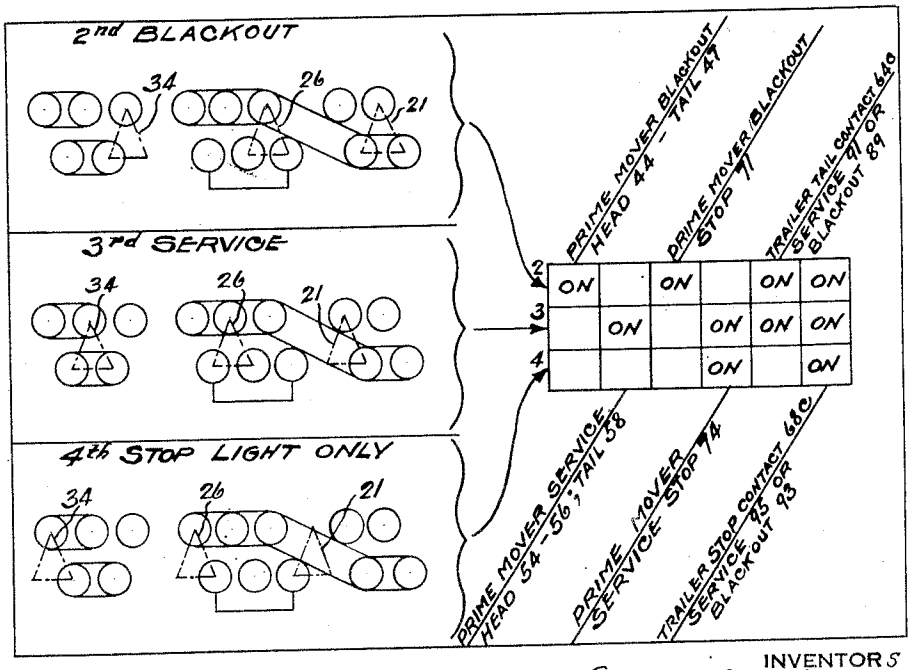


Fig. 2

INVENTORS
Arnold A. Bluemle and
William Earl Brown
by Spencer Hazelman & Fehr
their ATTORNEYS

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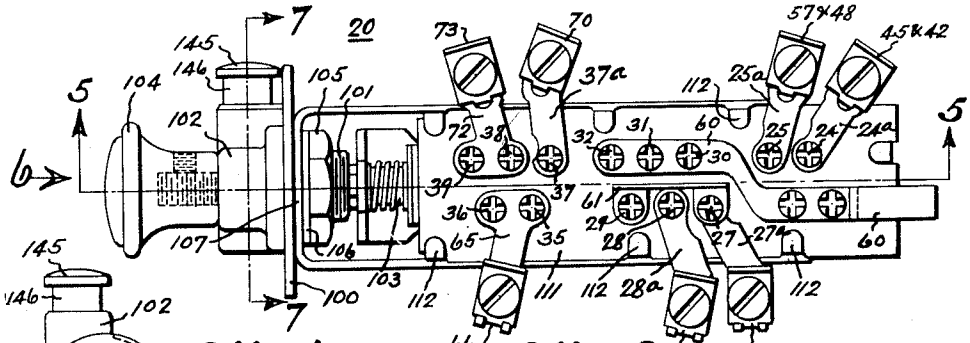


Fig. 6

Fig. 3

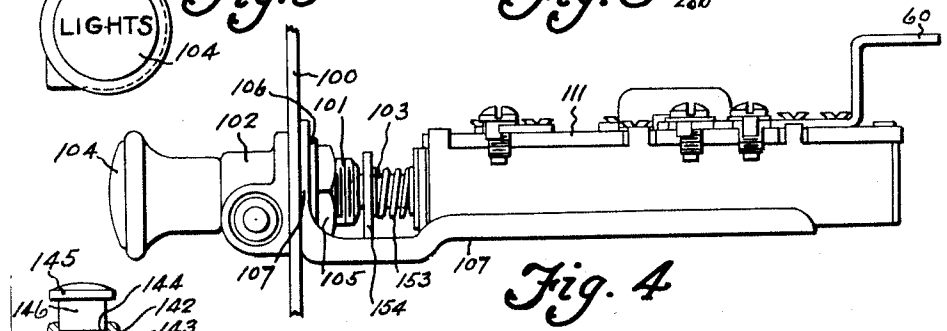


Fig. 4

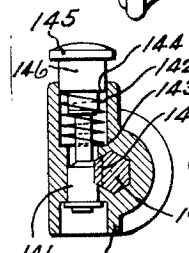


Fig. 7

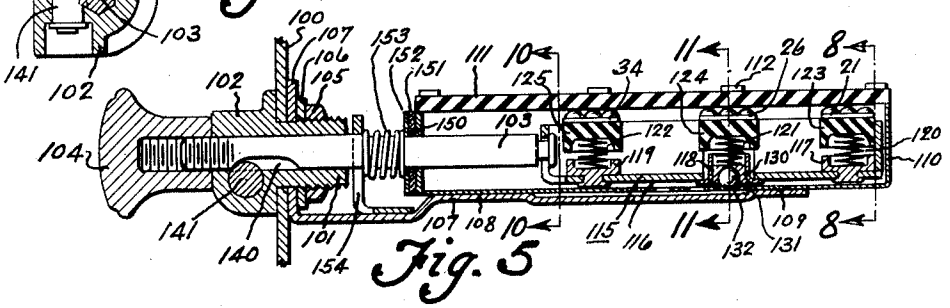


Fig. 5

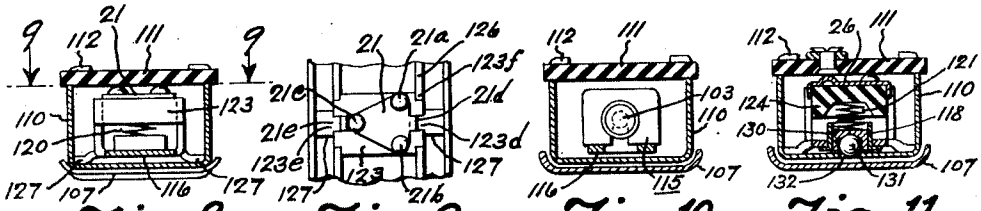


Fig. 8 Fig. 9 Fig. 10 Fig. 11

INVENTORS
Arnold A. Bluemle and
William Earl Brown
by Spencer Hardman & Fehr
their ATTORNEYS

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UNITED STATES PATENT OFFICE

2,309,039

LIGHTING SYSTEM

Arnold A. Bluemle and William Earl Brown, Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Application February 11, 1942, Serial No. 430,414

2 Claims. (Cl. 171—97)

This invention relates to lighting systems for automotive vehicles and more particularly on vehicles used by the U. S. Army. Such vehicles are provided with regular head and tail lamps and stop indicating lamps of usual brilliancy and also with other head, tail and stop indicating lamps of a special nature used for black-out purposes.

It is an object of the present invention to provide a lighting system for controlling the distribution of current to the regular or service head, tail and stop lamps or to the black-out head, tail and stop lamps of a prime mover or propelling vehicle and also to the service tail and stop lamps or to the black-out tail and stop lamps of a trailer.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred embodiment of one form of the present invention is clearly shown.

In the drawings:

Fig. 1 is a wiring diagram of a lighting system embodying the present invention.

Fig. 2 is a chart showing three operating positions of the main lighting switch of Fig. 1 and the various circuits which are established in accordance with these three positions.

Fig. 3 is a side elevation of the main lighting switch of Fig. 1.

Fig. 4 is a bottom plan view thereof.

Fig. 5 is a sectional view on line 5—5 of Fig. 3.

Fig. 6 is an end view looking in the direction of arrow 6 of Fig. 3.

Fig. 7 is a sectional view on line 7—7 of Fig. 3.

Fig. 8 is a sectional view on line 8—8 of Fig. 5.

Fig. 9 is a sectional view on line 9—9 of Fig. 8.

Fig. 10 is a sectional view on line 10—10 of Fig. 5.

Fig. 11 is a sectional view on line 11—11 of Fig. 5.

The system shown in Fig. 1 includes a main lighting switch 20 which comprises three groups of stationary and movable contacts. Group 1 comprises a movable contact 21 engageable with stationary contacts 22, 23, 24 and 25. Group 2 comprises a movable contact 26 engageable with stationary contacts 27, 28, 29, 30, 31 and 32. Group 3 comprises a movable contact 34 engageable with stationary contacts 35, 36, 37, 38 and 39. Contacts 21, 26 and 34 are shown in the "off" position in Fig. 1. They are moved into various "on" positions concurrently through the use of an operating rod which will be described later in connection with the description of the construction of the switch 20.

Group 1 of the switch contacts comprising contacts 21 through 25 are used to distribute current either to the black-out head and tail lamps or the service head and tail lamps of the prime mover vehicle. Contacts 22 and 23 are connected together by wire 40 with a battery 41. Contact 24 is connected by wires 42 and 43 with black-out head lamps 44. Contact 24 is connected by wires 45 and 46 with black-out tail filaments 47. Contact 25 is connected by wire 48 with dimmer switch 49 having a movable contact 50 for connecting wire 48 either with wire 51 or with wire 52. Wire 51 is connected by wires 53 with service head lamp main or bright filaments 54. Wire 52 is connected by wire 55 with service head lamp depressed beam or dim filaments 56. Wire 57 connects terminal 25 with service tail lamp filament 58.

The second group of contacts 26 through 32 distribute current to a stop light switch and to a trailer tail lamp connector. Contacts 30, 31 and 32 are connected by strap 60 with contacts 23 and 22 and hence with battery 41. Contacts 29 and 27 are connected together by strap 61 and by wire 62 with a stop lamp switch 63 which is normally open, but is closed whenever the brakes are applied. Contact 28 is connected by wire 28b with trailer tail lamp connector socket 64.

The third group of contacts 34 through 39 is employed for making connections between the stop light switch and the service or black-out stop lamps. For this purpose contacts 35 and 36 are connected together by strap 65 connected by wire 66 with wire 67 connected with stop light switch 63. Wire 67 is also connected with trailer stop lamp connector socket 68. Sockets 64 and 68 are mounted on a base 69. Contact 37 is connected by wire 70 with black-out stop light filament 71. Contacts 38 and 39 are connected together by strap 72 connected by wire 73 with service stop light filament 74.

Trailer tail lamp connector socket 64 is connected by plug 64a and by wire 64b with contact 64c of a distributor switch 80 mounted on the trailer. Trailer stop connector plug 68 is connected by plug 68a and wire 68b with contact 68c. Switch 80 comprises two groups of stationary and movable contacts. One group comprises the stationary contact 64c and stationary contacts 81 and 82 and a movable contact 83 for connecting contact 64c either with contact 82 as shown or with contact 81. Another group of contacts of switch 80 comprise contact 68c and

contacts 84 and 85 and a movable contact adapted to connect contact 68c either with contact 85 as shown or with contact 84. Contact 81 of the first group is connected by wires 87 and 88 with trailer black-out tail filaments 89. Contact 82 is connected by wire 90 with trailer service tail lamp filament 91. Contact 84 is connected by wire 92 with trailer black-out stop lamp filament 93. Contact 86 is connected by wire 94 with trailer service stop lamp filament 95. The movable contacts 83 and 86 are rotatable about a common axis represented by the point 96 and are connected by insulating part 97 with an operating member 98. Contact 83 engages contacts 64c and 82 when contact 86 engages contacts 68c and 85. When contact 83 engages contacts 64c and 81, contact 86 will engage contacts 68c and 84; therefore in the position of contacts 83 and 86 with switch 80 as shown, the service tail and service stop lamp filaments of the trailer will be connected with sockets 64 and 68 of connector base 69. In the other position of sockets 83 and 86 the black-out tail and black-out stop filaments of the trailer will be connected with sockets 64 and 68.

In the position of the movable contacts 21, 26 and 34 of the main switch 20 as shown in Fig. 1 no lamps are connected with the battery 41. When these movable contacts are in the second or black-out position as indicated by the upper left-hand panel of Fig. 2, the following elements will be connected as indicated in the upper line of the right-hand panel of Fig. 2: prime mover black-out head lamp 44 and black-out tail lamp filaments 47; prime mover black-out stop lamp filament 71 (which will burn when switch 63 is closed); trailer tail lamp terminal 64c; trailer stop terminal 68c. For a black-out the contacts 83 and 86 of switch 80 will be moved from the position shown to the other position thereby connecting the trailer black-out tail filaments 89 and the trailer black-out stop filament 93 (which will burn when switch 63 is closed).

In the third or service position of contacts 21, 26 and 34 of the main switch 20 as indicated in the middle left-hand panel of Fig. 2 the following elements will be connected as indicated by the middle line of the right-hand panel: prime mover service head filaments (either 54 or 56 depending on the position of contact 50 of dimmer contact 49); prime mover service tail lamp filament 58; prime mover service stop lamp 74 (which will burn when switch 63 is closed; trailer tail lamp switch contact 64c; trailer stop lamp contact 68c (which will burn when switch 63 is closed). When black-out is not required the switch 80 is in the position shown in Fig. 1; therefore the trailer service tail lamp filament 91 will burn; and the trailer service stop light filament 95 will burn when thes top light switch 63 is closed.

The fourth position of the contacts 21, 26 and 34 of switch 20 is shown in the lower left-hand panel Fig. 2. This is the daylight driving position. As shown in the lower line of the right-hand panel of Fig. 2, when the movable contacts of switch 20 are in the fourth position, the prime mover service stop lamp filament 74 will burn when the stop light switch 63 is closed and also the trailer service stop-light filament 95 which would be connected with the stationary contact 68c of switch 80 when driving in the daytime.

No lamps can be connected with the battery when the main switch is in the "off" position. Not even the stop lights will burn when switch 63 is closed.

The main lighting switch 20 will now be described with reference to Figs. 3 through 11. The metal dash or instrument panel 100 is apertured to receive the threaded shank 101 of a metal casting 102 which slidably supports a rod 103 attached to a handle or knob 104. The threaded shank 101 receives a nut 105 which is tightened against a washer 106 to clamp a switch mounting bracket 107 against the back of a dash 100. The mounting bracket 107 is welded at 108 and 109 to a sheet metal switch case 110 supporting a switch case back or cover plate 111 of insulating material. Plate 111 carries the various stationary contacts of the switch in the relation shown in Fig. 1. The terminal plates of Fig. 3 which have not been indicated diagrammatically in Fig. 1 are terminal plate 37a connecting contact 37 with wire 70; terminal plate 28a connecting contact 28 with wire 28b; terminal plate 27a connecting contact 27 with wire 62; terminal plate 25a connecting contact 25 with wires 57 and 48; plate 24a connecting contact 24 with wires 45 and 42. Switch back 111 is secured by tanks 112 of the case 110 bent into notches of the switch back.

Rod 103 is connected as shown in Figs. 5 and 10 with movable contact carriage 115 having a bottom 116 supporting spring retainers 117, 118 and 119 receiving respectively springs 120, 121 and 122 which urge, toward the back 111, insulating contact supporting blocks 123, 124 and 125 supporting respectively the movable contacts 21, 26 and 34. The diagram Fig. 1 indicates these contacts to be of triangular formation. The contacts are all of the same shape. The contact 21 is shown in plan view in Fig. 9. At the three corners of the triangular plate 21 there are three contact bosses 21a, 21b and 21c. The plate 21 has tangs 21d and 21e received by notches 123d and 123e of the non-conducting block 123 having at each corner, a notch 123f for receiving a flange portion 126 integral with the carrier bottom 116. The carrier bottom 116 has feet 127 shown in Figs. 8 and 11 which rest on the bottom of the switch case 110 when the switch is in the position shown in Figs. 4 and 5. Thus the bottom 116 of the carrier is spaced from the bottom of the case 110 to provide clearance for the lower ends of the spring retainers 117, 118 and 119 as shown in Fig. 5. The spring 121 presses downwardly on a detent block 130 carrying a ball 131 which ratchets into and out of a plurality of openings 132 defining the four positions of the switch.

In order that the switch handle 104 will not be pulled inadvertently into the third or bright light position, a spring operated latch will operate to prevent movement of the knob 104 beyond the second or black-out position unless a button is depressed. For this purpose the rod 103 is provided with an elongated notch 140 (Figs. 5 and 7) which receives a latch bolt 141 held in latching position by spring 142 confined between a shoulder 143 of casting 102 and a shoulder 144 of push-button 145 attached to the shank 146 of latch pin 141. The notch 140 is of such length as to permit movement of rod 103 from first or "off" position to second or black-out position, but no further. Rod 103 can be moved to third position or to fourth or stop-light only position provided the button 145 is pressed down so that the shank portion 146 of pin 141 comes adjacent the rod 103. After button 145 is pushed down, then rod 103 may be moved to the third and fourth position indicated in the chart, Fig. 2.

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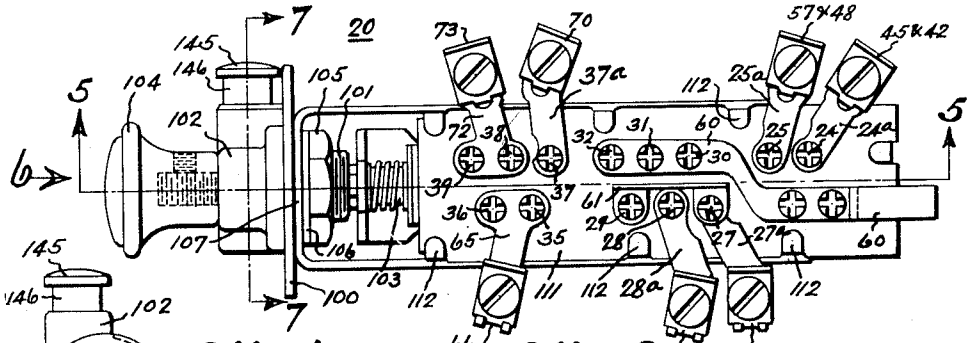


Fig. 6

Fig. 3

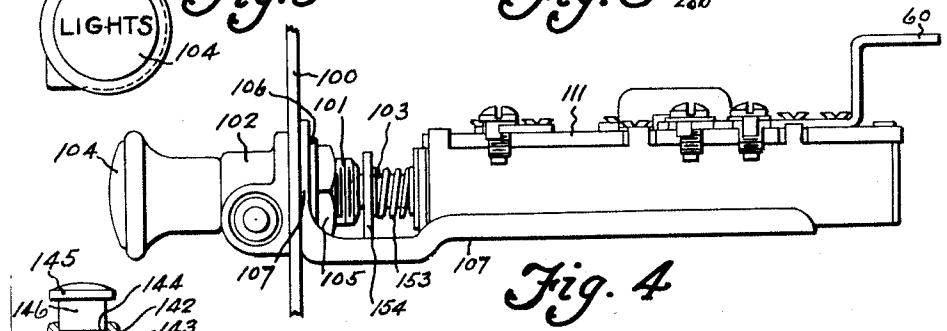


Fig. 4

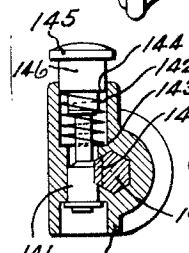


Fig. 7

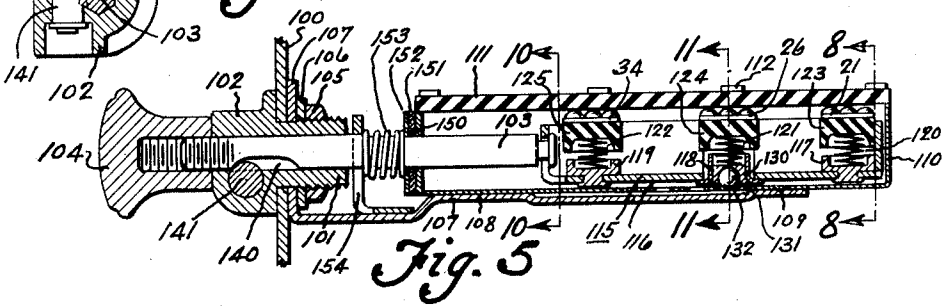


Fig. 5

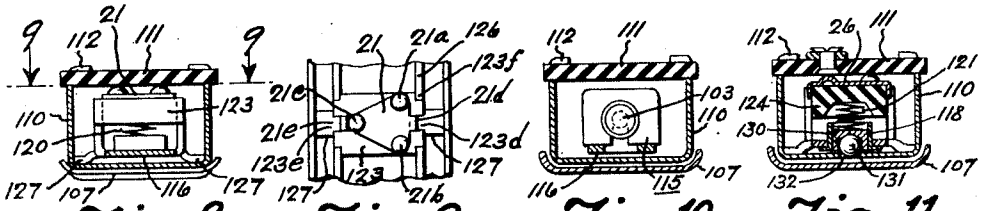


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