June 24, 1924. 1,499,236

L. McMILLAN

METHOD AND APPARATUS FOR SIGNALING

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Fig. 1.

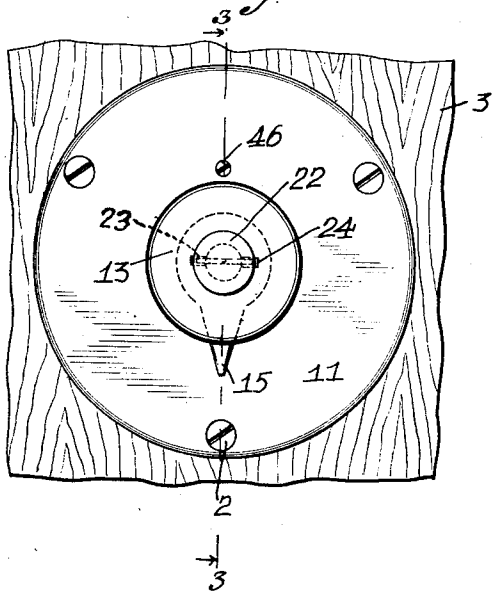


Fig. 2.

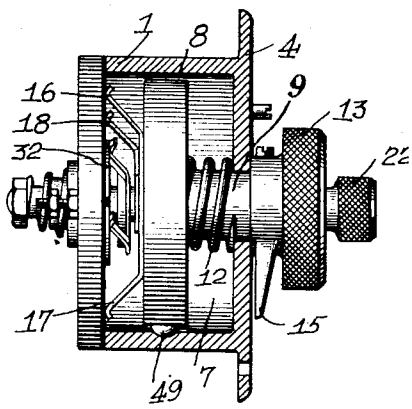


Fig. 3.

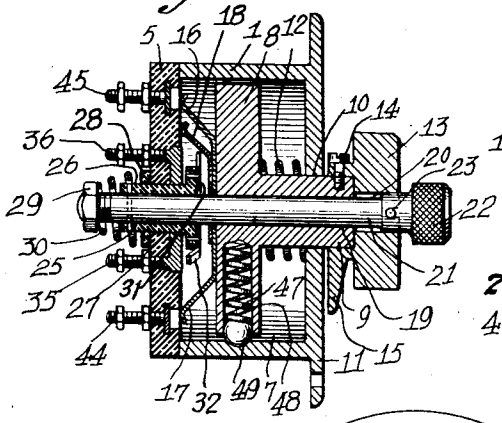


Fig. 4.

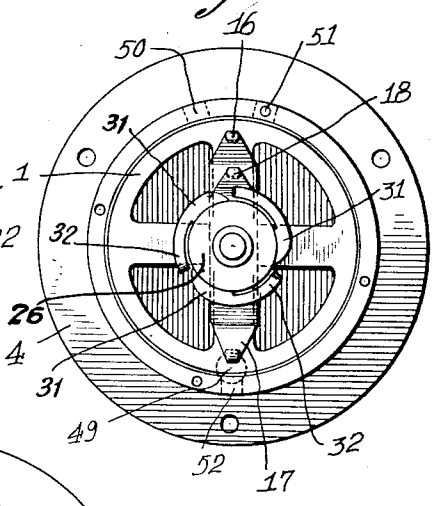
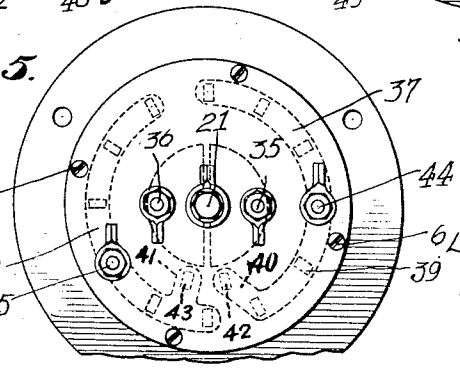


Fig. 5.



WITNESSES

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Fig. 6.

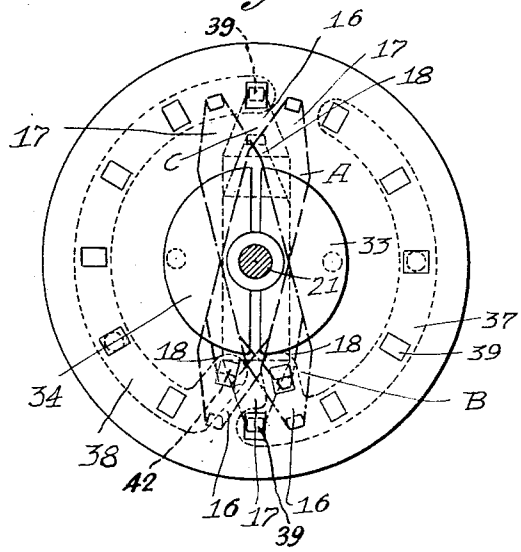
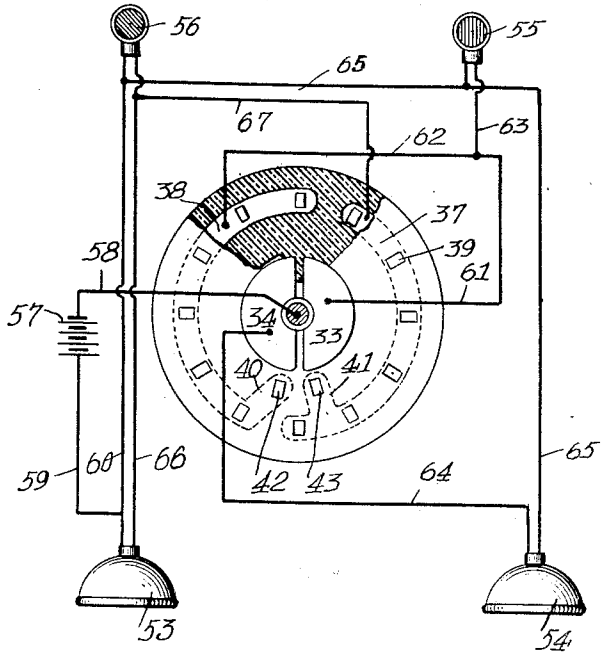


Fig. 7.



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UNITED STATES PATENT OFFICE.

LINCOLN McMILLAN, OF SAN DIEGO, CALIFORNIA.

METHOD AND APPARATUS FOR SIGNALING.

Application filed September 28, 1920. Serial No. 413,395.

To all whom it may concern:

Be it known that I, LINCOLN McMILLAN, a citizen of the United States, and a resident of San Diego, in the county of San Diego and State of California, have invented a new and Improved Method and Apparatus for Signaling, of which the following is a full, clear, and exact description.

This invention relates to a method and apparatus for signaling, and has particular reference to a method and apparatus for signaling with vehicle lights.

An object of the invention is to provide a method by which any change in the direction or speed of a vehicle can be indicated by the simple manipulation of the lights of the vehicle.

A further object resides in the maintenance of the indication during the time that the change of speed or direction is taking place.

A still further object is to provide a simple, compact apparatus to perform all the necessary signaling with the minimum number of operations.

Further objects of the invention will be apparent from the following description and claims taken in connection with the drawings.

It is desirable when travelling in a vehicle at night that the operator be readily able to indicate to other operators proceeding in either direction relative to himself, when he is about to make a change in the speed or direction of motion of his vehicle. This can be very satisfactorily achieved by the manipulation of the lights of the vehicle in an unmistakable manner, whereby other operators can readily perceive the character of the change and at all times during the change be aware of it.

I accomplish this purpose generally as follows: By placing a suitable switching device on the instrument board of the vehicle readily accessible to the operator's hand and providing electrical circuits connecting this switch with the lights and a suitable source of current, I can operate to produce the following results:—

1. By placing the switch in a normal position, all the lights of the vehicle are lit.

2. By moving the switch from this normal position to an extreme position in one direction, all the lights of the vehicle during this movement are intermittently flashed, and when they arrive at the extreme position the lights on one side of the vehicle only are lit, the lights on the other side being extinguished.

3. Similarly, a movement from normal position in the other direction will intermittently flash all the lights and result at the end of the movement in the lights on the other side alone remaining lit.

Furthermore, by the addition of an auxiliary switch I can extinguish all the lights on the vehicle, excepting the rear red tail light, when the car is to be parked.

This method and apparatus, therefore, provide a visual signal which indicates the imminence of a change in direction, in speed, and ultimately indicates the particular change about to take place.

The invention is illustrated in the drawings, of which—

Figure 1 is a view of the switch as seen on the instrument board of the automobile;

Figure 2 is a side view, looking in the direction of the arrows in Figure 1, with a section cut through the cover or casing of the switch;

Figure 3 is a section taken on the line 3—3 of Figure 1;

Figure 4 is an inverted plan view of the switch with the bottom plate removed;

Figure 5 is an inverted plan view of the device;

Figure 6 is a plan view of the inner face of the bottom plate showing the various contacts and three important positions of the switching members; and

Figure 7 is a circuit diagram of the electrical connections.

As illustrated in the drawings, in which the preferred form of my invention is shown as preferably embodied in connection with an automobile, the device comprises a cup-shaped, cylindrical, metallic casing 1 which may be fastened in any suitable manner, such as by screws 2, to the instrument board 3 of the automobile in connection with the operation of which this method and apparatus are to be used. The casing 1 is provided with a flange portion 4 having suitable apertures through which the screws 2 may be introduced into the instrument board 3. The rear of the casing 1 is provided with an insulating plate 5 of any suitable insulating material, such as fiber. This plate can be fastened to the body portion of the receptacle 1 by any suitable means, such as screws 6. Within the interior bore 7 of

the casing 1 a circular plate 8 is located. This plate has a projecting bearing portion 9 extending from one face thereof through an aperture 10 in the cover 11 of the casing 1. A spring 12 is disposed around the projecting portion 9 between the inner face of the cover 11 and one face of the plate 8. This spring, therefore, tends to move the plate 8 and the bearing portion 9 normally toward the open end of the casing 1. That part of the bearing portion 9 which extends through the aperture 10 in the cover 11 is embraced by a knurled thumb nut 13 fastened to the portion 9 by a screw 14, and carries integrally therewith an indicating pointer 15.

To the face of the plate 8, toward the open end of the casing 1, are attached spring contacting arms 16, 17 and 18. These arms are conductively connected together and to the plate 8. The plate 8, portion 9, and thumb nut 13 are provided with apertures 19 and 20 through which a shaft 21 extends. At one end, this shaft is provided with a small, knurled thumb nut 22 which has a projecting pin 23 therein adapted to normally lie in a slot 24 in the outer face of the thumb nut 13. The other end of the shaft 21 extends through a bore 25 in an insulating bushing 26, which itself passes through an aperture 27 in the fiber plate 5. The bushing 26 is pinned to the shaft 21 and is surrounded on the outer face of plate 5 by a fiber washer 28 between which and a nut 29 of the shaft 21 a spring 30 is placed, which normally tends to move the shaft 21 to the left, as viewed in Figure 3, thereby tending to hold the pin 23 in the slot 24 and to keep separate the inner face of bushing 26 from the contact plates 16, 17, and 18.

The inner face of the bushing 26 is provided, as shown in the preferred form, with three metallic plates 31 (Fig. 4), each of which is provided with a depending, resilient contact finger 32. These plates contact with each other but are spaced at their inner edges on the bushing 26 away from the shaft 21 and do not make electrical contact therewith. These fingers, in the normal position of shaft 21, are adapted to make contact with a pair of metallic, separated, semicircular plates 33 and 34, Fig. 6 which are suitably embedded in the inner face of plate 5 and are conductively connected through the rear of plate 5 with terminals 35 and 36. Because of the fact that there are three conductively connected contact fingers co-operatively related to the plates 33 and 34, it is readily seen that when these fingers 32 are in their normal position the plates 33 and 34 are always electrically connected in any position in the rotary movement of the shaft 21. By gripping the thumb nut 22 and moving it to the right, as seen in Figure 3, the pin 23, is removed from the slot 24 against the action of spring 30 and, at the same time, the plates 31 are moved into contact with the plates 16, 17 and 18, and the resilient fingers 32 are withdrawn from contact with the plates 33 and 34. By giving the thumb nut 22 a quarter turn in either direction from normal position, this withdrawn position of the shaft 21 can be maintained. Similarly, thumb nut 13 can be manipulated to move the plate 8 to the right against the action of the spring 12 and thereby withdraw plates 16, 17 and 18 from contact with any co-operating members. A pair of metallic conducting plates 37 and 38, each somewhat semicircular and annular in form, are embedded beneath the surface of plate 5 and have a plurality of contact points, such as 39, extending to and flush with the inner face of plate 5.

As viewed in Figures 5, 6 and 7, the lower end of each conducting plate 37 and 38 is provided with inwardly projecting portions 40 and 41 which carry additional contacting points 42 and 43 which are radial in a position nearer the center of shaft 21 than the contacting points 39. The spring contacting plates 16, 17 and 18 are adapted in their movement to contact with these points, the plates 16 and 17 making contact with the points 39, and the plate 18 adapted to contact with the points 42 and 43. The conducting plates 37 and 38 are connected to the rear face of fiber plate 5 by terminals 44 and 45.

The face of cover 11 is provided with a stop pin 46 which limits the movement in either direction of the indicating pointer 15. The plate 8 is provided with a bore 47 in which is located a spring 48 contacting by a ball 49. In the movement of the plate 8 this ball contacts with the inner periphery of bore 7, and in various positions of the indicating pointer 15 will protrude slightly into apertures 50, 51 and 52 formed in the side walls of receptacle 1, as shown in Figure 4. This engagement of the ball with these apertures forms a semipositive means for latching the switch in various positions, from which it can be moved by the application of sufficient pressure to the thumb nut 13 to force the ball 49 into the bore 47 against the action of spring 48.

As viewed in Figures 6 and 7, the switch has three definite positions, in each of which a different arrangement of lights is effective. Figure 6 represents a view of the inner face of plate 5, as if the observer were looking directly at the face, and the various positions of the contacting plates 16, 17 and 18 thereon are noted in dotted lines. Position A of the plates, shown in dash lines, is the position in which plate 18 contacts with the points at 42, the plates 16 and 17 not

making electrical contact. The position B, designated by dot and dash lines, is the position in which plate 18 makes contact with point 43, the plates 16 and 17 not making electrical contact. Position C, shown in dotted line, is the position in which plate 18 does not make electrical contact; whereas plates 16 and 17 make contact with points 39 on the conducting plates 38 and 37, respectively.

Referring to Figure 1 and Figure 6 at the same time, position A would be the position of the switch in which the indicating pointer 15 would rest against the right-hand side of point 46. Position B would be the position of the switch in which the indicating pointer 15 would rest against the left-hand side of point 46. Position C is the position in which the pointer is shown in Figure 1. The apertures 50, 51 and 52 are respectively located so that the ball 49 engages them in these positions to temporarily and semipositively latch the switch therein.

The electrical connections are shown in Figure 7, in which are represented a right-hand headlight 53, a left-hand headlight 54, the left red tail light 55, and a right green tail light 56. A source of current 57 is provided connected at one side to the shaft 21 by wire 58, and on the other side by wire 59 to a wire 60 which extends to the headlight 53 and the tail light 56. A wire 61 is connected to plate 33. This wire connects on the one hand with wire 62 leading to conducting plate 38, and on the other hand with wire 63 leading to one side of the rear red tail light 55. A wire 64 is connected to plate 34 and leads to one side of the left-hand headlight 54. The other side of the headlight 54 is connected by wire 65 to one side of the tail lights 55 and 56. Another side of headlight 53 is connected by wire 66 to one side of tail light 56 and by wire 67 to conducting plate 37.

Except under conditions which will be hereinafter set forth, it will be recognized from the description hereinbefore mentioned that the wire 58 leading from the source of current 57 and connected to the shaft 21 is conductively connected to the spring contacting plates 16, 17 and 18, so that in whatever position these plates are placed they are always connected to one side of the battery.

Assuming, for the purpose of understanding the operation of the device, that the switch is in position represented by the letter C in Figure 6, and as shown in Figures 1 and 2 of the indicating pointer 15 extending downwardly. In this position plate 16 contacts with the upper outermost point 39 of plate 38, and plate 17 contacts with the lower outermost contact 39 on plate 37. The resultant circuit for this position can, therefore, be traced as follows: from the battery 57, wire 58, shaft 21, plate 8, plate 17, point 39, on conducting plate 37, wires 62 and 67, through the rear right green tail light 56, wire 59, through the opposite side of the battery, and from wire 67 to wire 66, through the right headlight 53, and thence to wire 59 on the other side of the battery. At the same time and in the same position of the switch, contact plate 16 connected with shaft 21 and wire 58 makes contact with a point 39 on conducting plate 38, and thence through wire 62, wire 63, to one side of the red left tail light 55, and thence to wire 65, wire 60, wire 59, to battery. A connection also leads from wire 62 through wire 61 to plate 33 which is connected to plate 34 in any position by the spring contact fingers 32, and from plate 34, by wire 64 to one side of left headlight 54, thence through wire 65, back to the other side of tail light 55, thence to wire 60, wire 59, to battery. In other words, in this position of the switch, all the lights are lighted.

Now if the switch is moved from this normal position with the indicating point extending downwardly to the position A, in which the indicating point bears against the right side of stop 46, the ends of contact plates 16 and 17 will alternately make contact and break contact with the various points 39 on the conducting plates 37 and 38, which will cause an intermittent flashing action of all lights until the position A is reached, as seen in Figure 6. In this position, the only electrical contact made is between contact plate 18 and the contact point 42 on conducting plate 38. In this position of the switch it will be noted that the contacting plate 16 is not electrically connected to any circuit, and, likewise, the contacting plate 17 is unconnected. Contacting plate 18, however, is connected with point 42 to establish the following circuit:— from battery 57, wire 58, shaft 21, contacting plate 18, point 42, conducting plate 38, wire 62. From this point two paths are formed, one over wire 63, through left red tail light 55, over wire 67, to wire 60, wire 59, back to battery. The other path from wire 62 leads through wire 61, plate 33, through contact fingers 32, to plate 34, wire 64, left headlight 54, wire 65, through wire 67 and to battery, as above mentioned.

These are the only circuits energized and, therefore, the tail and head lights on the left side of the car are illuminated when the position A is reached, and all the lights are intermittently flashed between the time the switch leaves the normal position and the time this ultimate position is reached. The right tail and head lights are not lit, since one side of each of them is connected to conducting plate 37 with which none of the contacting plates 16, 17 and 18 is in contact in this position.

On the other hand, when the switch is

moved from position C to position B, which brings the indicating pointer 15 up against the left-hand side of stop 46, a similar action with respect to the flashing of all the lamps takes place; and when position B is reached, the following circuit can be traced: from battery 57, wire 58, shaft 21, contact plate 18, contact point 43 on conducting plate 37; whereas in position A contact plate 18 may contact with contact point 42. From contact point 43, the circuit is traced through conducting plate 37, wire 67, to one side of tail light 56 and to one side of headlight 53, and from the other side of each of these lights to wires 60 and 59, and thence to battery 57. It will be here noted that the lights 54 and 55, when the switch is in position B, are not lit, since conducting plate 38, to which one side of each of these lights is connected, is not in circuit. Therefore, it is apparent that when the switch is in normal position, all lights are lit; and by moving in either direction from this position, all the lights are flashed, until an ultimate extreme position in either direction is reached, whereupon the lights which are only on one side or the other of the machine remain lit. To return the switch from either extreme position to normal position without flashing, a pull is exerted on thumb nut 13, which, acting against spring 12, lifts the contact plates 16, 17 and 18 out of contact with the contact points 39.

When it is desired to park the car and leave only the red tail light 55 lit, it is merely necessary to turn the switch to position A and then pull on thumb nut 22 to remove pin 23 from the slot 24, giving the shaft 21 a quarter turn to retain the pin in this position, as previously mentioned. In this position of the shaft 21, the contacting fingers 32 are out of engagement with plates 33 and 34. Therefore, the following circuit may be traced: from battery 57, wire 58, shaft 21, contacting plate 18, contact point 42, conducting plate 38, wire 62, wire 63, through red tail light 55, wire 65, wire 60, wire 59, back to battery. By eliminating the bridging action between plates 33 and 34 on the front of contact fingers 32, the circuit between wire 62 and headlight 54 is opened, so that the red tail light 55 is the only light lit.

It can, therefore, be readily observed that I have provided a method of signaling which unmistakably indicates the continuance of a car's movement by all the lights being lit, both front and rear; which indicates the imminence of a change in direction or speed by flashing all the lights, both front and rear; which specifically denotes the character of the change about to take place by ultimately retaining lighted the front and rear lights of the car on that side of the car toward which the motion of the car is to be directed; and which retains this specific indication during the change. I, furthermore, provide a single switch which is capable of operation with a minimum number of movements to perform the above-mentioned method and to transmit the signals as above set forth.

I claim:

1. A method of indicating a change in velocity of a vehicle, which comprises flashing the lights substantially at each of the four corners of a vehicle intermittently prior to the change and retaining certain of the lights of said vehicle lighted just before and during the change to indicate the nature thereof.

2. A method of indicating the velocity of a vehicle, which comprises maintaining the lights substantially at each of the four corners of said vehicle lighted during the maintenance of a uniform velocity, flashing all the lights of the vehicle when a change is imminent, and retaining certain of the lights of said vehicle lighted just prior to and during the change to indicate the nature thereof.

3. A vehicle signaling and indicating system comprising a plurality of lights on said vehicle, a source of current therefor, switching means, electrical connections between the switching means, the source, and the lights, said switching means comprising means for maintaining the lighting of all the lights, means for intermittently and simultaneously flashing all the lights, and means for maintaining lighted only certain of said lights.

4. A signaling and indicating system for a vehicle having lights, comprising switching means, said switching means comprising means co-operating therewith in the normal position thereof to light all the lights, means co-operating therewith in an extreme abnormal position to retain certain only of said lights lit, and means co-operating therewith during the movement of the switch from the normal to an abnormal position to intermittently flash all the lights.

5. A signaling and indicating device for vehicles having signal lights, comprising rotatable switching means, said switching means having a normal and two extreme positions, means co-operating with said switching means in either extreme position to retain certain only of said lights lit in this position, and means co-operating with said switching means to intermittently flash all the lights in a movement of the switch from the normal to either extreme position.

6. A signaling and indicating device for vehicles having lights, comprising rotatable switching means mounted on the instrument board, means co-operating with said switching means to retain all the lights lit in one position thereof, means co-operating

with said switching means to retain certain only of said lights lit in another position thereof, an auxiliary switch co-operating with said first-mentioned switching means, and means connected therewith to retain one only of said lights lit when said auxiliary switch is operated.

7. A signaling and indicating device for vehicles having lights, comprising rotatable switching means, means co-operating with said switching means to retain all the lights lit in one position thereof, means co-operating with said switching means to retain certain only of said lights lit in another position thereof, an auxiliary switch co-operating with said first-mentioned switching means, and means connected therewith, when said first-mentioned switching means is in a definite position, to retain one only of said lights lit when said auxiliary switch is operated.

8. A signaling device for vehicles, comprising a hollow cylindrical casing, an insulating plate enclosing one end of said casing, a pair of annularly shaped contacting plates on said insulating plate, a rotatable shaft within said casing, contacting elements thereon adapted to connect with said contacting plate, a battery, a plurality of front and rear lights on said vehicle, the front and rear lights on one side of said vehicle being connected between said battery and one of said contacting plates, the lights on the other side of said vehicle being connected between said battery and the other of said plates, a second set of contact plates on said insulating plate, means for normally bridging the second set of contacting plates, connections between a headlight and one of said second set of contact plates, a connection from the other of said contact plates to the contacting plate on said insulating plate, and means for removing the bridging means to cut the circuit.

LINCOLN McMILLAN.