

April 16, 1940.

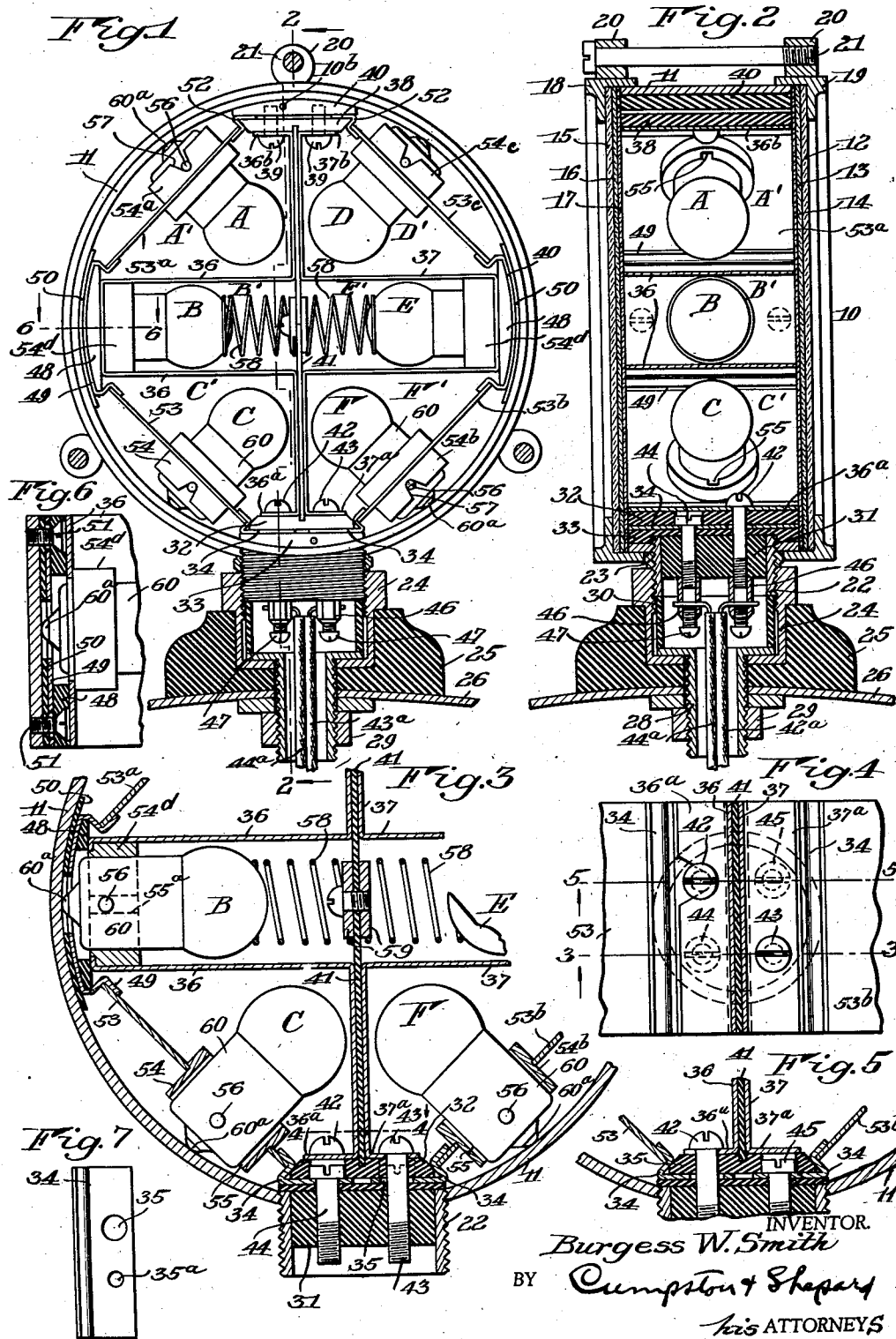
B. W. SMITH

2,197,226

DIRECTIONAL SIGNAL

Filed Dec. 14, 1936

4 Sheets-Sheet 1



April 16, 1940.

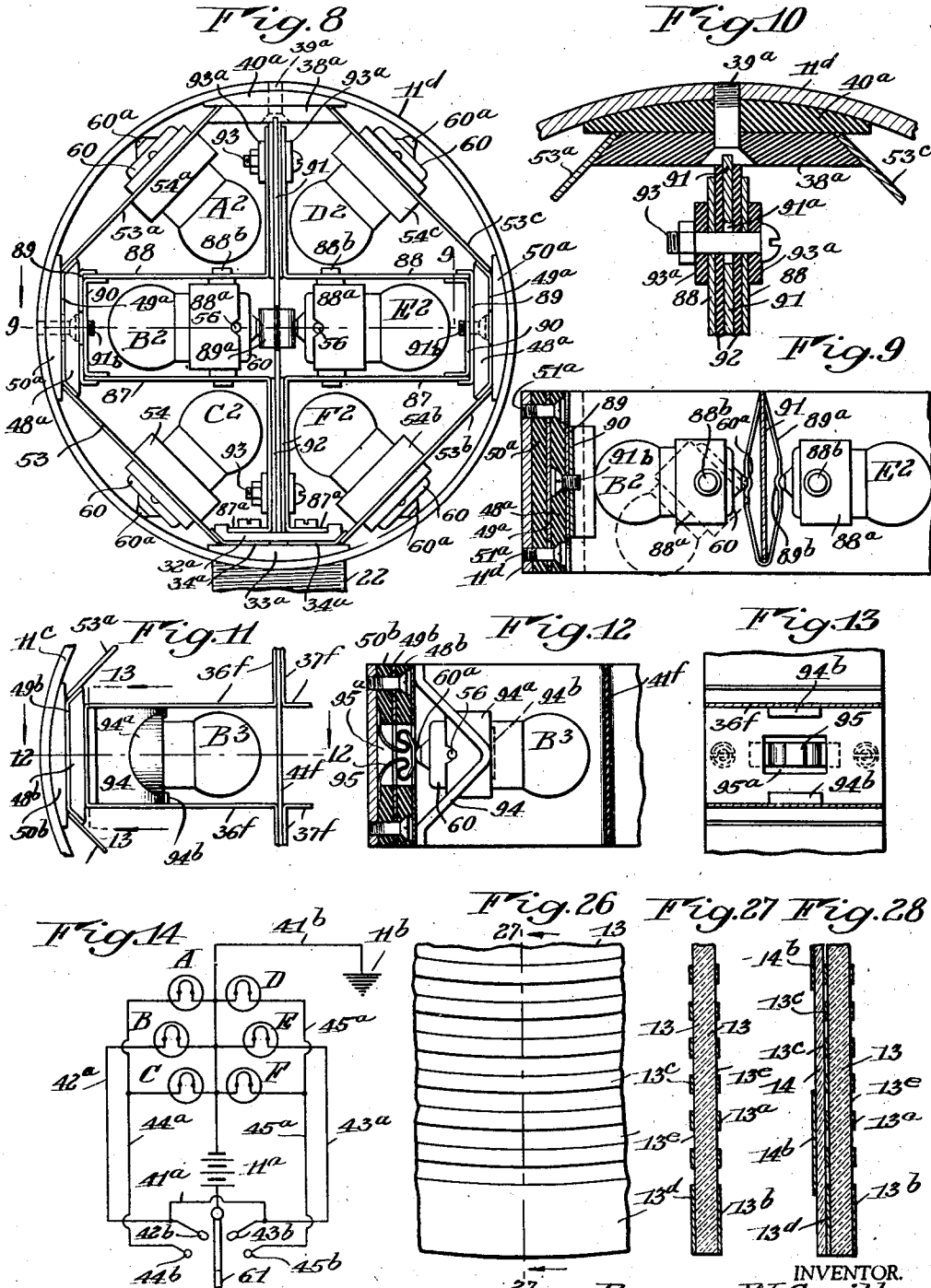
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Fig. 15

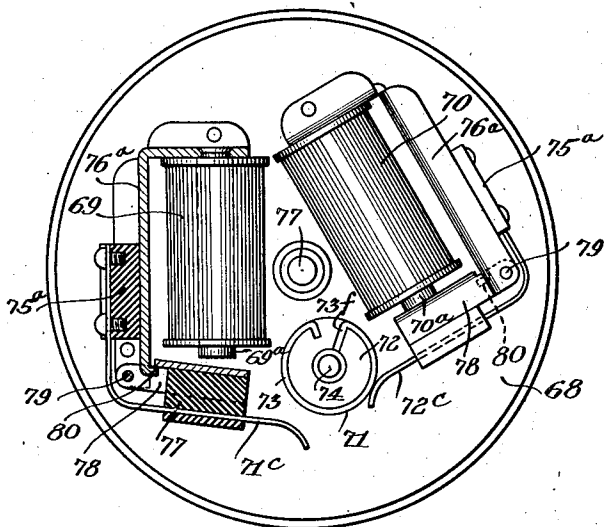


Fig. 18

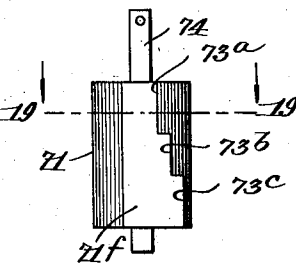


Fig. 19

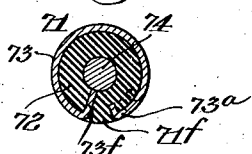


Fig. 16

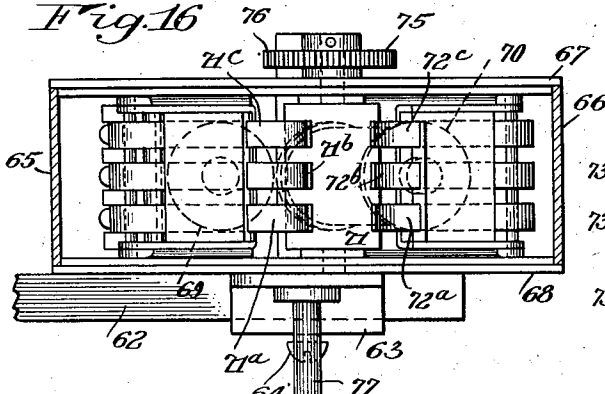


Fig. 17

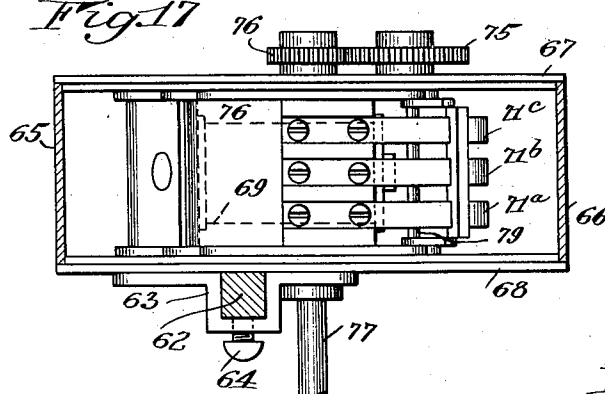
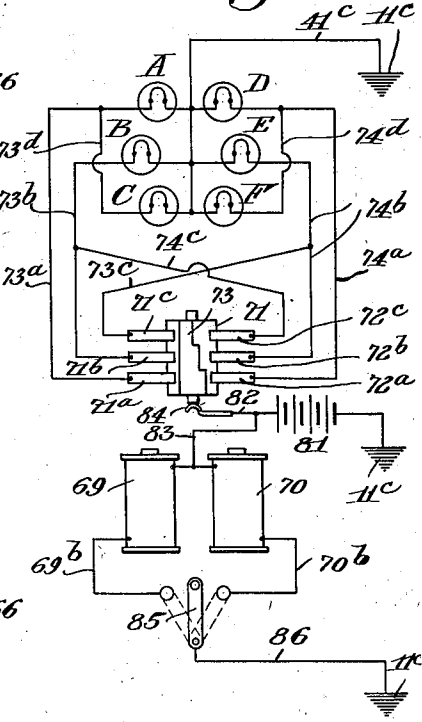


Fig. 20



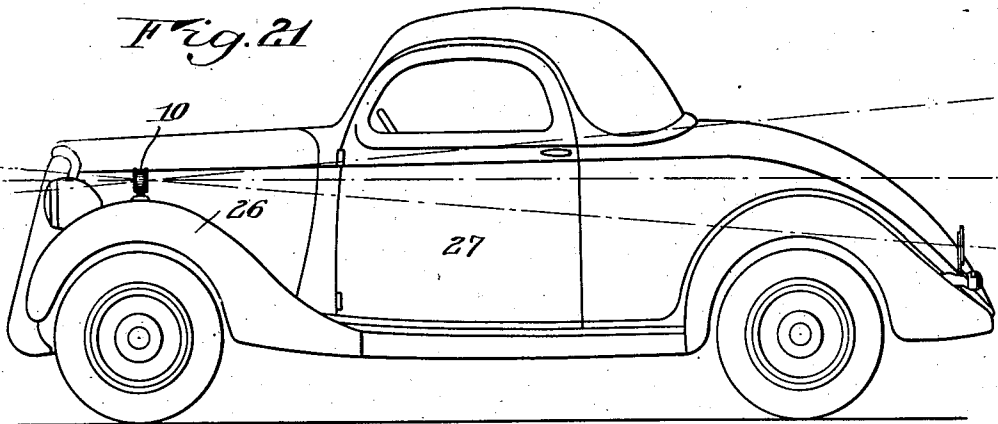
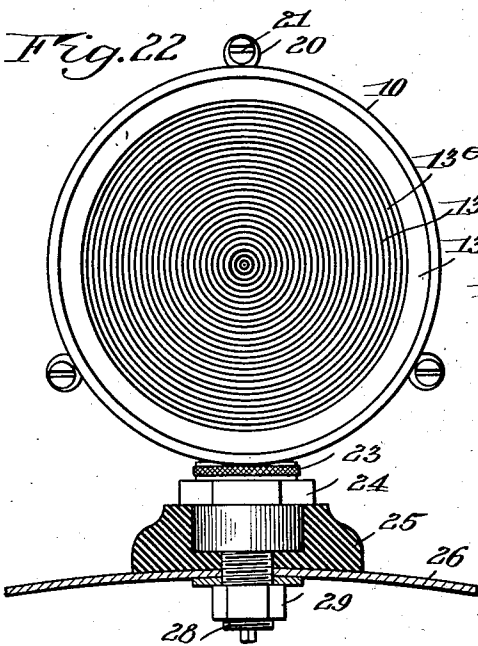
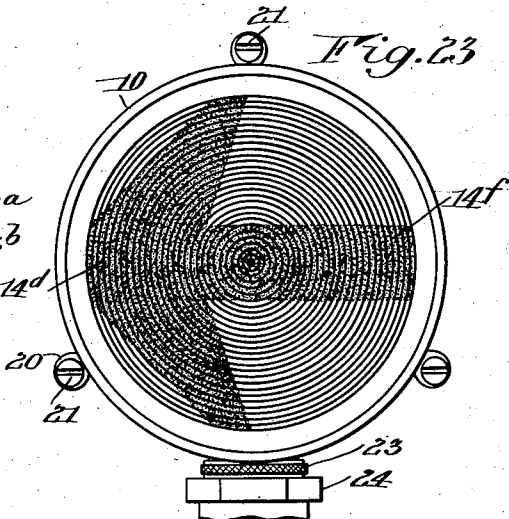
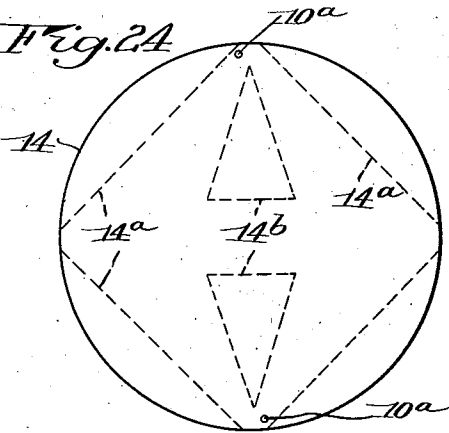
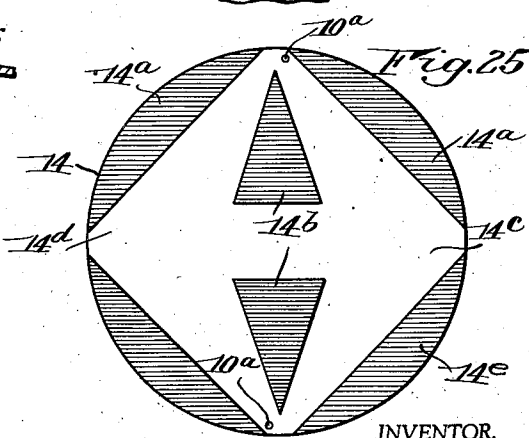
INVENTOR.
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BY Cumpston & Shepard
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UNITED STATES PATENT OFFICE

2,197,226

DIRECTIONAL SIGNAL

Burgess W. Smith, Rochester, N. Y.

Application December 14, 1936, Serial No. 115,796

6 Claims. (Cl. 177—329)

The present invention relates to directional signals for use on motor vehicles designed to indicate to those approaching the vehicle, either from the front or rear, the direction in which the driver intends to proceed preparatory to making a turn.

One object of the invention is to provide a signal of this class embodying a compact and simplified construction which can be manufactured at a relatively low cost and which will operate effectively for the purpose intended.

A further object of the invention is to provide in a device of this type means forming a plurality of signals for indicating a change in the direction of movement of the vehicle, together with means for selectively illuminating the signals.

A further object of the invention is to provide in a signal of the class described a casing having a plurality of electric light bulbs or lamps grounded on the casing and supported by devices detachably mounted therein and cooperating therewith to complete the lamp circuits whereby to avoid the use of circuit wires within the casing and to permit the lamps to be readily assembled within and withdrawn from the casing when desired.

A further object of the invention is to provide a lamp casing having a plurality of lamp compartments with lamps therein, some of which afford an indicating signal pointing in one direction and some of which will form another indicating signal pointing in a different direction, the arrangement being such that each of the illuminated signals will be visible from opposite sides of the casing.

A further object of the invention is to provide a directional signal for use on motor vehicles, including a casing provided with light transmitting members having indicating signals formed thereon, the casing being provided with electrically controlled means for illuminating the signals, said light transmitting members having lenses associated therewith through which the signals are made visible only upon operation of the illuminating means within the casing.

A further object of the invention is to provide an improved device of the class described, including a casing containing a direction-indicating signal with illuminating means therefor and a colored lens forming a closure for the casing and having a plurality of zones impervious to light and of a shade or color contrasting to that of the lens and serving to render the signal invisible under light rays emanating from an exterior light source.

A further object of the invention is to provide an improved lens for use with a signaling device of the class described.

A still further object of the invention is to provide an improved combination of lens elements for use with signaling means of the present type.

A further object of the invention is to provide an improved device of the class described in which the signals are so protected that they cannot be illuminated to the extent of being rendered visible under exposure to exterior light sources such, for example, as sunlight or the headlights of approaching vehicles, thus avoiding confusion on the part of the drivers of such vehicles and accidents which might result if false or unintended signals were indicated.

A further object of the invention is to provide improved selectively controlled means for automatically flashing the signals whereby to increase their effectiveness as a means for warning the drivers of other vehicles approaching from opposite directions.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a part sectional elevation of a signaling device illustrating one form of the invention;

Fig. 2 is a transverse section taken on line 2—2 of Fig. 1;

Fig. 3 is a fragmentary sectional elevation on line 3—3 of Fig. 4;

Fig. 4 is a horizontal section on the line 4—4 of Fig. 3;

Fig. 5 is a fragmentary sectional elevation on line 5—5 of Fig. 4;

Fig. 6 is a horizontal section on line 6—6 of Fig. 1;

Fig. 7 is a detailed view of one of the contact plates shown in Fig. 3;

Fig. 8 is a part sectional elevation illustrating a casing similar to that shown in Fig. 1 and containing a modified arrangement of signal lamps, the cover of the casing being omitted to better illustrate the arrangement of the various parts contained therein;

Fig. 9 is a horizontal section taken on line 9—9 of Fig. 8;

Fig. 10 is a fragmentary sectional elevation through the upper wall of the casing shown in Fig. 8, illustrating the manner of grounding one of the lamp circuit connections on the casing;

Fig. 11 is a fragmentary elevation of a modified

arrangement of parts for establishing a ground between certain of the lamps and the casing therefor;

Fig. 12 is a horizontal section on line 12—12 of Fig. 11;

Fig. 13 is a sectional elevation on line 13—13 of Fig. 11;

Fig. 14 is a diagrammatic view illustrating a manually controlled electric circuit arrangement for the lamps illustrated in Figs. 1 and 8;

Fig. 15 is a part sectional plan of a device for automatically controlling and flashing the signals;

Fig. 16 is a part sectional elevation of the same;

Fig. 17 is a similar section, as viewed from the left of Fig. 16;

Fig. 18 is a detailed view of the commutator shown in Fig. 15;

Fig. 19 is a transverse section on line 19—19 of Fig. 18;

Fig. 20 is a diagrammatic arrangement of the electric circuit and the control means therefor shown in Figs. 15 to 17, inclusive;

Fig. 21 is a view of a motor vehicle showing the signal applied to one of the fenders thereof;

Fig. 22 is a view in elevation of the signal as it appears when not illuminated, means being shown by which it is connected with the vehicle;

Fig. 23 is a view showing the signal as it appears when certain of the lights are turned on;

Fig. 24 is a face view of one of the direction indicating disks mounted within the signal casing;

Fig. 25 is a similar view showing the opposite face of the disk;

Fig. 26 is a view illustrating a portion of one of the lenses shown in Fig. 2, drawn to an enlarged scale;

Fig. 27 is a sectional view on line 27—27 of Fig. 26, and

Fig. 28 is a sectional view, including the lens element shown in Fig. 27 and an additional lens element associated therewith.

The same reference numerals throughout the several views indicate the same parts.

The invention embodies generally a direction indicating device for use on motor vehicles which is so constructed and mounted as to be visible to the drivers of other vehicles approaching from opposite directions when the signal is illuminated preparatory to making a turn, either to the right or left. The device, however, is designed to prevent the signals from being rendered visible by sunlight or the headlights of approaching vehicles and other exterior light sources when the lights disposed within the casing containing the signals are turned off. The signalling device is preferably placed on the left hand front fender of the vehicle but may be mounted on top of the vehicle, or on a suitable upstanding support positioned next to the driver's seat, or at any other suitable point.

The casing containing the signals may be of any preferred shape or design and has therein a plurality of open ended pockets protected by different colored lenses at opposite sides of the casing, the pockets being shaped to simulate arrows pointing in different directions and the lamps or other suitable illuminating means being disposed within or adjacent the pockets, or in such position as to effectively illuminate the same. The lamps corresponding to each of the arrows are selectively controlled by a suitable switch placed on or near the steering wheel, or in a position

to be conveniently operated by the driver of the vehicle. Improved means for automatically flashing the signals is also provided which can be operated by a suitable electric motor or any preferred means connected with and adapted to be driven by the engine of the vehicle.

Referring to the drawings, 10 designates generally a lamp casing or housing which may be oblong, octagonal, or circular in shape as preferred. In the present embodiment the casing comprises a metal ring or band 11, one end of which is closed by a plurality of disks or lenses 12, 13, and 14, the opposite end being closed by a similar arrangement of disks or lenses 15, 16, and 17 as shown in Fig. 2. The disks are preferably held in position by the oppositely disposed frame rings 18 and 19, each of which is provided with lugs 20, the lugs of one of the rings being threaded to receive the connecting screws 21 as shown in Fig. 2. The characteristics and purposes of the different disks or lenses at the opposite ends of the lamp housing will be described hereinafter.

Threaded within the bottom of the lamp housing is a tubular member 22 provided with a locking nut 23 which forms a seat or stop for a cup-shaped member 24 forming a housing for certain parts described hereinafter. The cup-shaped member is seated within a recess of a supporting base 25 of rubber or other suitable insulating material, said base being adapted to rest on the fender 26 of the motor vehicle, designated generally by the reference numeral 27, Fig. 21, or some other part thereof. The base 25 is clamped upon the fender by a tubular connecting member 28 which extends through the bottom of the cup-shaped member 24 downwardly through the wall of the fender and which is clamped in position by a nut 29, as shown in Fig. 2. A ring 30 of insulating material is disposed within the cup-shaped member 24 and is preferably held in position by the tubular member 22, within the upper end of which is a block 31 formed of suitable insulating material, and above which is disposed the upper and lower spaced insulating blocks 32 and 33, respectively, both overlying the lower wall of the metal ring 11, as shown in Figs. 1 and 2. The blocks 32 and 33 are separated by a pair of similarly constructed metal plates 34 forming electrical circuit connections or contacts for other parts disposed within the lamp housing as described hereinafter, said plates having relatively large and small openings 35 and 35a therein, respectively. Mounted within the housing are a pair of U-shaped partition members 36 and 37 which are best shown in Fig. 1. The lower ends 36a and 37a of the partition members 36 and 37, respectively, are seated on the insulating block 32 while the upper ends 36b and 37b of said members are seated on a block of insulating material 38 at the opposite side of the casing, which is suitably connected by means of screws 39 extending through the portions 36b and 37b of the U-shaped members 36 and 37 with the insulating block 40, seated on the inner wall of the casing. The U-shaped partition members are separated by a vertically extending plate 41, formed of suitable insulating material, the ends of the plate being disposed within the grooves formed in the insulating blocks 32 and 38, as shown in Figs. 1 and 3.

Four binding posts for the lead-in wires of the lamp circuits are extended within the cup-shaped member 24 which are preferably in the form of screws, two of which are shown, one at 42 and another at 43 in Fig. 3 of the drawings.

The head of the screw 42 is seated on the portion 36a of the U-shaped member 36 while the head of the screw 43 is seated on the portion 37a of the U-shaped member 37. The screws 42 and 43 are extended through the relatively large holes 35 of the contact plates 34 in spaced relation to said plates. The two additional binding posts constitute the screws 44 and 45, the heads of which are disposed within the insulating block 32 and on the contact plates 34, said screws being extended through smaller holes 35a of the contact plates 34. The four screws shown in Fig. 4 are extended through the insulating block 31 and have threaded on their outer ends the elongated nuts 46 which are provided with transverse openings for the reception of the ends of the circuit wires or connections, as shown in Figs. 1 and 2, screws 47 being threaded within the nuts to secure said ends therein.

The U-shaped members 36 and 37 have their central outer portions seated on similarly constructed insulating blocks 48 which are fitted within the channel-shaped contact members 49, between which and the wall of the lamp casing are disposed the strips 50 formed of suitable insulating material, all as shown in Fig. 1. The insulating blocks 48, the contact members 49, and the strips of insulating material 50 are provided with centrally disposed openings, as shown in Figs. 3 and 6, for a purpose which will appear hereinafter, said parts being preferably secured to the wall of the lamp housing by means of the screws 51, as shown in Fig. 6. At the top of the lamp housing a pair of angular supports 52 are clamped between the blocks of insulating material 38 and 40, said supports being insulated from the lamp casing by the block 40, as shown in Fig. 1.

Positioned within the casing are four similarly constructed resilient metallic plates or members 53, 53a, 53b, and 53c, said members being provided with lamp sockets 54, 54a, 54b, and 54c, respectively, the sockets being adapted to receive and support the electric bulbs or lamps designated by the reference characters C, A, F, and D, respectively, which extend within the triangular compartments C', A', F' and D', as shown in Fig. 1.

The sockets are each provided with oppositely disposed grooves 55 for the passage of the projecting pins or lugs 56 on the lamps, which upon rotation of the lamps, each to a predetermined position, will take into the notches 57 of the sockets whereby rotation of the lamps is prevented when they are assembled within the casing, as shown in Fig. 1.

The U-shaped partition members 36 and 37 are provided with similarly constructed socket members 54d for receiving and supporting the lamps B and E, as shown in Figs. 1, 3, and 6, said socket members having oppositely disposed slots 55a for receiving the pins or lugs 56 of the lamps B and E to prevent turning of the latter within the sockets.

The lamps B and E are each held in position by coiled springs 58, the outer ends of the springs being seated on the free ends of the bulbs and their opposite ends having disposed therein the disks 59 suitably secured on the insulating plate 41 which serve to hold the springs in proper position with respect to the lamps.

The lamps have the usual metal contact portions 60 and 60a for the passage of the current to and from the filament, the portions 60 engaging the sockets, through which the current flows,

and the portions 60a being grounded on the lamp casing as best shown in Figs. 3 and 6.

Beginning with the binding posts shown in Figs. 1 to 5, inclusive, and with which the four lead-in wires are connected the current supplied to lamp C will flow through binding post 44, contact member 34, supporting parts 53 and 54 for lamp C and through the contacts 60 and 60a of the lamp to the grounded casing 11, current at the same time being supplied to lamp A through the members 34, 53, 49 and the supporting members 53a and 54a therefor, and thence through the contact portions 60 and 60a of the lamp to the grounded casing member 11. The current supplied to lamp B will flow through binding post 42, U-shaped partition member 36, socket member 54d, and the contacts 60 and 60a of the lamp to the grounded casing.

At the other side of the casing current will flow through the binding post 45, contact member 34, supporting parts 53b and 54b for the lamp F and thence through the contacts 60 and 60a of the lamp to the grounded casing, current at the same time flowing through binding posts 45, contact member 34, the supporting member 53b for the lamp F, the channel shaped member 40, the supporting parts 53c and 54c of the lamp D and the contacts 60 and 60a of said lamp to the grounded casing. Current supplied to lamp E will flow through binding post 43, U-shaped partition member 37, socket member 54d, and the contacts 60 and 60a of lamp E to the grounded casing.

As previously stated the compartments within which the lamps are disposed are so shaped and arranged that when certain of the lamps are illuminated an arrow pointing in one direction will be rendered visible both at the front and back of the signal. Furthermore when the lamps forming another group are illuminated, the arrow pointing in the opposite direction will be visible, both from the front and back sides of the signal. For example, when the lamps A, B, C, and E are illuminated, an arrow pointing to the left as viewed in Fig. 1 will be rendered visible, while if the lamps D, E, F, and B are illuminated an arrow pointing to the right will be rendered visible.

With the circuit arrangement shown in Fig. 14 the lamps for rendering visible the right and left hand arrows can readily be turned on to illuminate either of the arrows as may be desired. Furthermore the lamps corresponding to each of the arrows can be selectively or progressively illuminated in a manner to attract attention by indicating motion, as described hereinafter.

The diagrammatic arrangement of the lamp circuit shown in Fig. 14 is such that the lamps A, B, C, and E will be illuminated when the switch is in one closed position and the lamps D, E, F, and B being illuminated when the switch is moved to another closed position. For example, when the movable member 61 of the switch is in engagement with the contacts 42b and 44b, Fig. 14, the lamps A, B, C, and E will be illuminated. In this case, current will flow from battery 11a through the movable member 61 of the switch, contact 44b, wire 44a, lamps A and C, and connection 41b to ground 11b. At the same time current will flow through contact 42b, wire 42a, lamp B to ground and connection 41a, wire 43a, lamp E, and connection 41b to ground. On the other hand, if the movable switch member 61 is in engagement with the contacts 43b and 45b, lamps D, E, F, and B will be illuminated. In this case, current will flow

from battery through the movable switch member 61, contact 45b, wire 45a, lamps F and D, and connection 41b to ground. At the same time, current will flow through contact 43b, wire 43a, lamp E to ground, and also through connection 41a, wire 42a, lamp B and connection 41b to ground.

The resilient lamp supporting plates or members 53, 53a, 53b, and 53c are inserted in position within the casing after the lamps have been properly positioned within the sockets of said members, with the result that the supporting members are deflected inwardly of the casing by the pressure of the lamps thereon, through engagement of the central terminal portions 60a of the lamps with the inner face of the casing, the pressure being sufficient to hold the supporting members in assembled relation within the casing. In other words, the upper edges of the topmost members 53a and 53c will be firmly held in contact with the angular supports 52 while the lower edges of said members will likewise be held in contact with the upper flanged portions of the channel-shaped contact members 49. On the other hand, the upper edges of the lower supporting members 53 and 53b are urged in engagement with the lower flanges of the contact members 49 while the lower edges of said supporting members are urged in engagement with the flanged portions of the contact plates 34, as shown in Fig. 1.

The lamps A, C, D, and F can thus be readily assembled within or withdrawn from the casing without the use of tools when desired. The same applies to the lamps B and E, the central terminal portions 60a of which are urged in engagement with the inner face of the casing by the springs 58, it being understood that to detach these lamps it is only necessary to move them inwardly against the resistance of the springs far enough to withdraw them from the socket members 54a, after which they can be readily withdrawn, assuming, of course, that the disks for closing the ends of the casing have first been removed.

It will be understood that the circuit wires 42a, 44a, 43a, and 45a, of the wiring diagram shown in Fig. 14 are extended into the cup-shaped member 24 of Fig. 1, and that they are respectively connected with the screws or binding posts 42, 44, 43, and 45 of said figure.

In moving the switch member 61 of Fig. 14 to the left it will engage the contact member 42b in advance of its engagement with the contact 44b which will result in first illuminating the lamps B and E located in the central compartments B' and E' of the housing. Upon further movement of said switch member it will engage the contact 44b, at which time the lamps A and C will be illuminated to complete the head of the arrow, which will conform substantially to the shape afforded by the compartments A', B', and C', the stem of the arrow being formed by the compartment E'. The same will be true, of course, if the switch member 61 is moved to the right of Fig. 14, in which case the lamps B and E will first be illuminated upon engagement of said member with the contact 43a and then the lamps D and F, when said member is moved into engagement with the contact 45b. Thus it will be seen that certain groups of the lamps corresponding to either of the arrows may be illuminated one in advance of another, thereby making it possible to illuminate the compartments containing the lamps of said groups in a predetermined

order, which will increase the effectiveness of the signal by affording an indication of a moving arrow.

In Figs. 15 to 19, inclusive, is shown a device for automatically flashing the signals which may be driven either by a small electric motor or by gearing or other means suitably connected with and driven by the engine of the vehicle. This device comprises a supporting arm or member 62 for connection with the frame or body of the vehicle, and a bracket 63 adjustably held on the arm by means of the set-screw 64, the bracket having connected therewith a casing designated generally by the reference numeral 65 and comprising side, top, and bottom walls, 66, 67, and 68, respectively. Mounted within the casing is a pair of solenoids or magnets 69 and 70 the cores of which are indicated at 69a and 70a, respectively. Rotatably mounted within the casing is a commutator 71 comprising a core 72 formed of insulating material and a metal sleeve 73 thereon, the opposite edges of which are spaced apart as shown in Figs. 18 and 19 (to provide a non-metallic surface 71f). The commutator is supported for rotation within the casing by a shaft 74 the opposite ends of which are journaled in suitable bearings in the end walls of the casing. The outer end of the shaft is provided with a gear 75 meshing with a pinion 76 on a drive shaft 77 journaled in the bracket 63 on the bottom of the casing and in the upper wall 67 of the casing, the shaft being adapted for operation by any suitable means such as a small electric motor or a part adapted to be driven by the engine of the vehicle as previously stated.

One of the edge portions of the sleeve 73 is turned inwardly at 73f and contacts with the shaft or arbor 74, as shown in Fig. 19. The opposite edge of the sleeve is formed to provide the stepped portions 73a, 73b, and 73c, as shown in Fig. 18, for a purpose which will presently be described. Two sets of brushes are provided for cooperation with the commutator, one corresponding to the lamps A, B, C, and E, and the other to lamps D, E, F, and B, shown in the wiring diagram of Fig. 20.

One set of brushes is designated by the reference numerals 71a, 71b, and 71c, while the other set is designated by the reference numerals 72a, 72b, and 72c, Figs. 16 and 20. The brushes are in the form of resilient spring-like members, the fixed ends of which are suitably connected with the blocks of insulating material 75a carried by the brackets 76a for supporting the magnets 69 and 70 within the casing 65. The free ends of the brushes are carried by the blocks 77 formed of insulating material which are suitably secured within the channel-shaped armatures 78, the outer ends of which are pivotally connected at 79 with the brackets 76 as shown in Fig. 15. The armatures 78 are normally held in engagement with the abutments 80 of the brackets 76 by the brushes which, being of spring material, tend to move outwardly or in a direction away from the magnets, the armatures being moved into engagement with the cores of the magnets upon energizing the magnets by closing the circuits corresponding thereto.

Current for energizing the magnets 69 and 70 may be supplied by a suitable source, such as the battery 81, which may be grounded on the frame of the machine at any desired point. The battery is connected with the solenoids by means of the wires 82 and 83, as shown in Fig. 20, and

is also connected with the commutator by means of the contact member 84 which at all times engages the lower end of the shaft 74 for rotating the commutator.

A switch 85 for controlling the circuits of the flasher may be placed on or adjacent the steering wheel or instrument board of the machine and moved to the left to close the circuit through the connection 69b of the solenoid 69, or to the right to close the circuit through the connection 70b of the solenoid 70, depending on which direction the driver of the vehicle intends to turn, the switch having a connection 86 grounded on the frame or body of the vehicle at any desired point.

In the operation of the flashing device, assuming that the commutator 71 is constantly rotated by the shaft 77 and gears 76 and 75 for driving the same, the movement of the switch member 85 to the right hand dotted line position shown in Fig. 20 will result in the movement of the armature 78 into contact with the core 70a of the magnet 70 whereby the brushes 72a, 72b, and 72c will be moved into position to contact the commutator as shown in Fig. 15. The brushes 72a, 72b, and 72c, will then successively engage the stepped portions 73a, 73b, and 73c of the commutator sleeve, with the result that the lamps B and E will be successively illuminated, following which the lamps D and F will be simultaneously illuminated. In other words, current will flow first through brush 72c, connection 74c, and a portion of connection 73b to lamp B, and thence to ground 11c through connection 41c. Subsequently, current will flow through brush 72b, connection 74b, lamp E, and then to ground through connection 41c. Current will then flow through brush 72a, connections 74a, and 74b, to lamps D and F and through connection 41c to ground. The lamps B and E will therefore be successively illuminated, following which the lamps D and F will be simultaneously illuminated. The lamps B, E, and D and F will continue to flash in the order named as long as the switch member 85 is held at the right hand dotted line position shown in Fig. 20.

The same results will be obtained in the same manner if the control switch member 85 is held at the left hand dotted line position shown in Fig. 20, current then flowing first through brush 71c, connection 73c, and a portion of connection 74b to lamp E, and thence to ground through connection 41c. Brush 71b will then contact with the sleeve of the commutator at which time current will flow through connection 73b and lamp B to ground through connection 41c. Next when the brush 71a contacts with the sleeve 73 current will flow through connections 73a and 73d to the lamps A and C and thence to ground through connection 41c.

It will be understood that during rotation of the commutator that the brushes will intermittently engage the exposed portion 71f of the core of the commutator whereby the lights will become extinguished. It is apparent therefore that during rotation of the commutator the lights corresponding to either signal will be intermittently flashed and extinguished in a predetermined sequence. It will thus be seen that with the mechanism described, either set of signal lamps may be automatically and intermittently flashed preparatory to turning the vehicle in whichever direction the driver may wish to go merely by moving the switch member 85 to the desired position. Flashing of the lamps of either

set in the order named will increase the effectiveness of the signal by progressively illuminating different portions thereof, thus affording a more distinct indication of the direction of movement of the vehicle by reason of the appearance of an arrow moving in said direction.

The modified lamp arrangement shown in Figs. 8, 9, and 10 is generally similar to that shown in Figs. 1 and 2, the principal difference being in the mounting means for the two centrally disposed horizontal lamps shown in Fig. 8. The casing 11d is substantially the same as that shown in Fig. 1 and is provided with the same means for mounting it upon and connecting it with the fender 26 of the vehicle, and the same arrangement of binding posts and lead-in wires for supplying current to the lamps. The supporting members and sockets thereon for the lamps A2, C2, D2, and F2 are the same as the supporting members and sockets for the lamps A, C, D, and F, and have, therefore, been given the same reference numerals.

Moreover, the general arrangement of the lamps shown in Fig. 8 is the same as that shown in Fig. 1 and the compartments within which the lamps are disposed correspond in shape to those in which the lamps of Fig. 1 are mounted. The upper ends of the lamp supports 53a and 53c are urged in engagement with the beveled edges of the block 38a formed of insulating material and seated on the block 40a, also formed of insulating material, said blocks being held in position by means of the screws 39a, Fig. 10.

The lower ends of the supporting members 53a and 53c are urged in engagement with the flanged portions of the channel-shaped plates 49a clamped between the inner and outer blocks 48a and 50a which are formed of insulating material, said blocks being held in position by the screws 51a, Fig. 9. The upper ends of the lamp supports 53 and 53b are urged in engagement with the lower flanges of the channel-shaped members 49a as shown in Fig. 8. The lower ends of said supporting members are urged in engagement with the flanged portions of the angular contact members 34a similar to the members 34 of Fig. 1, and which are disposed between the blocks of insulating material 32a and 33a, similar in construction to the corresponding blocks 32 and 33 shown in Fig. 1.

The blocks 32a and 33a have the same arrangement of binding posts for the lead-in wires as that shown in Figs. 1 to 4, inclusive, the current flowing to and through the lamps A2 and C2 in Fig. 8, through the parts 34a, 53, 49a, and 53a and the lamp sockets and lamps as described in connection with the corresponding lamps shown in Fig. 1. This is also true with respect to the lamps D2 and F2 of Fig. 8 which are supported by parts similar to those for supporting the lamps A2 and C2. Moreover the resilient supports for the lamps A2, C2, D2, and F2 can be readily slid into and out of operating position and are securely held in said position by the pressure exerted thereon through engagement of the lamp contacts 60a with the wall of the casing 11d.

The lamps B2 and E2 are supported within the casing 11d by similarly constructed U-shaped partition members, each formed of the angular sections 87 and 88 connected by the channel-shaped members 89 and 90, said members being clamped together by the screws 91b which are extended through the insulating blocks 48a as shown in Fig. 9. The sections 87 are provided

with outwardly turned portions 87a which are seated on the insulating blocks 32a and electrically connected with the lead-in wires of the lamp circuits by the arrangement of binding posts shown in Figs. 1 to 5, inclusive.

A metal plate 91 is extended vertically through the casing between the partition members 87 and 88, the plate being separated from said members by the oppositely disposed strips of insulation 92 as shown in Figs. 8 and 10. The vertically disposed portions of the partition members 87 and 88 are clamped upon the strips of insulation 92 and the latter upon the metal plate 91 by means of the screws 93 which are extended through openings 91a in said plate in spaced relation to the latter as shown in Fig. 10, washers 93a of insulating material being provided for the heads and nuts of the screws as shown in Fig. 10. The metal plate 91 is electrically connected with the screw 39a, preferably by soldering, whereby said plate is grounded on the casing 11d, the lower end of the plate being insulated from the partition members 87 in the same manner as the upper end as indicated in Fig. 10.

The sockets 88a of the lamps B2 and E2 are each provided with oppositely extending trunnions 88b which are journaled in the partition members 87 and 88 as shown in Fig. 8, thus permitting the lamps to be swung downwardly to the dotted line position shown in Fig. 9 in order that each lamp may be readily withdrawn from its socket when desired, the latter having slots for the reception of the pins 56 on the lamps as indicated in the lower half of Fig. 3.

The lamps B2 and E2 are electrically connected with the metal plate 91 by means of the spring 89a which is looped around the plate and which is preferably secured thereon by having its upper ends connected therewith by soldering. The opposite leaves of the spring are provided with depressed portions 89b for the reception of the central contacts 60a of the lamps as shown in Fig. 9, the lamps being held in the position shown in said figure through frictional engagement of said contacts with the leaves of the spring which tend to move the lamps in opposite directions, thereby urging the trunnions of the lamps in contact with the walls of the partition members 87 and 88.

The lamps A2, C2, D2, and F2 are grounded on the casing 11d, current flowing to the lamps through the supporting parts therefor in the manner previously described in connection with the arrangement of lamps shown in Fig. 1. The current for illuminating the lamps B2 and E2 will flow thereto through the partition members 87, the trunnions 88b, the sockets 88a of the lamps and thence through the contacts 60 and 60a of the lamps, the leaves of the springs 89a, the plate 91 and the screw 39a, grounded on the casing 11d. The circuit connections for the lamps of Fig. 8 may be as shown for example either in Fig. 14 or Fig. 20, depending on whether or not the flashing mechanism is to be used.

The modification shown in Figs. 11 to 13, inclusive, embodies a different mounting means for the intermediate lamps B2 and E2 from that shown in Fig. 8. In this modification the housing 11d will contain the same general arrangement of lamps as that shown in Fig. 8 and the same lamp supporting devices, with the exception of the partition members 87 and 88 and other parts for electrically connecting the lamps B2 and E2 with the casing. In Fig. 11 a portion of the lamp housing is indicated at 11c, upon the inner wall of

which is secured the insulating blocks 48b and 50b and the channel-shaped plate 49b therebetween, which parts are generally similar to the corresponding parts 48a, 50a, and 49a of Fig. 8. The parts for supporting the lamps of this modification, corresponding to the upper and lower lamps of Fig. 8 will be the same, two of which are indicated at 53 and 53a in Fig. 11. The partition members for supporting the centrally disposed lamps, one of which lamps is shown at B3, will be generally similar to the partition members 36 and 37 of Fig. 1 and will be connected with the lamp casing in the same manner, said partition members being partially illustrated in Fig. 11 and designated by the reference characters 36f and 37f. The plate member 41f of Fig. 11, interposed between the partition members, is formed of insulating material and corresponds to and is provided for the same purpose as the plate member 41 of Fig. 1.

The lamp B3 is supported between the horizontal portions of the partition member 36f by means of an arch-shaped bracket 94, the upper and lower ends of which are seated on the transverse intermediate portion of the U-shaped partition member 36f, as best shown in Fig. 12. The bracket is provided with a socket 94a for the lamp B3, said bracket and socket being held in position by a pair of lugs 94b extending inwardly from the horizontal portions of the U-shaped partition member in engagement with the lamp socket as shown in Figs. 11 and 12. It will be understood that the bracket, the socket and the lamp therein constitute a unit which may be readily assembled between the horizontal portions of the U-shaped partition member by sliding it into position between said portions. The lamp is grounded on the casing 11c by means of a spring contact member 95 disposed within the opening 95a of the insulating blocks 49b and 50b, the ends of the spring being held in engagement with the wall of the casing by the insulating block 50b as shown in Fig. 12. The central contact 60a of the lamp engages the spring contact 95, the latter tending to urge the lamp inwardly of the casing, thereby causing the socket 94a of the lamp to be properly seated on the lugs 94b.

In this modification the current for illuminating the lamp B3 will flow through the U-shaped partition member, the socket of the lamp, the contact member 60 of the lamp, the filament and the contact 60a to the spring 95, which is grounded on the casing 11c, it being understood that the U-shaped partition member will be connected with the same binding posts and in the same manner as the corresponding partition member 36 of Fig. 1.

While only one of the centrally disposed lamps is shown in Fig. 11, it will be understood that the one corresponding in position to the lamp E of Fig. 1 will be the same as the lamp B3 of Fig. 12 and will be mounted in the same manner. Furthermore the lamp B3 is adapted to be detached from the socket 94a upon rotating it to a position at which the pins 56 will be aligned with the grooves of the socket, not shown, but which correspond to the grooves 55 of the socket 54 of Fig. 1.

As previously stated the signal is so designed that when the lights therein are turned off the direction indicating arrows will not be rendered visible by the rays of the headlights of an approaching vehicle or by sunlight or other exterior light sources. The driver of the approaching vehicle, therefore, cannot possibly become confused by the direction indicating signal under

such conditions, since the arrows can only be seen when illuminated by lights within the signal casing, which are not turned on until it is desired to make a right or left hand turn.

By making the front and rear lenses of contrasting or complementary colors the light entering the lamp casing from one side is absorbed by that entering from the opposite side, with the result that illumination within the casing resulting from the entrance thereto of exterior light is greatly reduced, thus tending to reduce the chances of the arrows being made visible when the lights within the casing are extinguished. This effect is further increased by providing a series of relatively narrow concentric rings or zones of opaque material on the outer faces of the lenses through which light cannot pass with intervening clear and relatively narrow rings or zones through which the signals will be rendered visible when illuminated by the lamps within the casing. It is also preferred to provide on the inner faces of the front and rear lenses light reflecting rings directly opposite the outer opaque rings, the inner rings being formed of silver or other suitable light reflecting material and provided for a purpose which will appear hereinafter.

The outer disks 12 and 15, shown at the front and rear sides of the lamp casing in Fig. 2, are each preferably formed of clear glass, said disks being provided as covers for holding the inner disks or lens elements in position upon the casing. The intermediate disks 13 and 16 at the front and rear sides, respectively, of the casing are similar except that they are formed of different or contrasting colors such, for example, as green and red, respectively, although they may be formed of other contrasting colors if desired.

The front and rear inner disks 14 and 17 may constitute opal glass or be formed of a similar shade of Celluloid, or other suitable light transmitting material, said disks having opaque material applied to portions thereof to outline the arrow heads pointing in opposite directions, as shown in Fig. 25 and more fully described hereinafter.

The intermediate front and rear lens elements 13 and 16 each has formed on its inner and outer faces a series of concentrically arranged relatively narrow rings spaced slightly apart, as indicated, for example, at 13a and 13c and with somewhat wider border rings 13b and 13d, as shown in Fig. 27, the material forming said rings being opaque or substantially impervious to light, while the surfaces lying between the rings, indicated at 13e, are left clear in order that the signals within the casing may be rendered visible when the latter is illuminated by the lamps mounted therein.

Since the rear lens elements 16 and 17, Fig. 2, are constructed in the same manner as the front lens elements, the latter only have been shown, with the inner and outer rings applied thereto, as indicated in Figs. 26, 27, and 28. The outer rings 13a and 13b are preferably copper colored, the inner rings 13c and 13d being preferably formed of silver or some other suitable light reflecting material, both sets of rings being formed of opaque material or material substantially impervious to light, which may be in the form of a suitable paint applied by any preferred method or in any desired manner.

While it is preferred to employ copper colored rings on the outer faces of the lens elements 13 and 16, other suitable shades or colors may be

used if desired, the idea being to provide lines of color contrasting to the colors of the lens elements, as well as to that of the transmitted arrows or other direction indicating devices within the casing, whereby to better obscure the signals when not in operation.

As previously stated, the signals or arrows within the casing are also greatly obscured by making the front and rear lens elements 13 and 16 of strongly contrasting colors, since the exterior light entering the casing through one of the lenses is totally absorbed by that of the other when the lights are turned off, thus preventing illumination of the signals to such an extent as to render them invisible, even when the lenses are illuminated by bright sunlight or by the headlights of an approaching vehicle. Furthermore the compartments forming the heads of the arrows in the opposite halves of the casing are similar in shape and since the stem of each arrow is formed in part by a portion of the head of the opposite arrow, the similarity of the compartments will make it difficult to distinguish one from another, especially in view of the character of the interior light resulting from the absorption of the light of one color by that of a complementary color when the lights are turned off.

Moreover, the arrows formed by the lamp partitions are of the open type, the partitions being of relatively thin material and permitting substantially all of the light entering the casing from each side thereof to pass through the arrows to the opposite side whereby to effect a more complete absorption of the light of one color by that of the other.

The advantage of providing the concentric rings of silver or light reflecting material on the inner faces of the front and rear lens elements 13 and 16, respectively, is that they will serve to reflect the light of the lamps in opposite directions within the casing, thereby more effectively illuminating the arrows in order that they may be rendered clearer and more distinct when the lights are turned on, preparatory to making a right or left hand turn.

Furthermore the silver rings of the oppositely disposed lens elements assist in obscuring the signals within the casing when the lights are turned off, since the rings of each lens will reflect light of a different color from one side of the casing to the other whereby a more complete absorption of the light of one color by that of the other will be afforded, thus increasing the efficiency of the signalling device.

Each of the front and rear translucent diffusing disks 14 and 17, respectively, has one face thereof coated with suitable opaque material, as indicated by the shaded areas 14a and 14b, whereby to outline the oppositely disposed right and left hand arrow heads 14c and 14d, respectively, as shown in Fig. 25, it being understood that the stem 14e of each arrow will be formed in part by the head of the opposite arrow when the lights corresponding to the different arrows are turned on. For example, when the lamps A, B, C, and E are illuminated the head and stem of the arrow will be outlined as indicated at 14d and 14f, respectively, in Fig. 23. However, when all of the lights are turned off neither of the arrows will be visible, the lenses 13 and 17 each then having a ground of a color afforded by the exterior opaque lines thereof contrasting to that transmitted to the arrows.

The disks or lens elements are provided with apertures 10a adjacent their opposite edges for

the reception of the pins 10b carried by the insulating blocks 33 and 40, as shown in Fig. 1, whereby the disks are held in proper assembled relation upon the opposite sides of the lamp casing.

It will be understood that the light diffusing disks having the arrows formed thereon may be omitted and plain light diffusing disks substituted therefor, in which case the arrow forming pockets only will constitute the direction indicating signals.

Furthermore, instead of forming the opaque concentric rings on the opposite faces of each of the front and rear colored disks or lenses such, for example, as the green and red lenses, said rings may be formed on additional or separate disks, one to be placed adjacent each colored disk. The additional disk may be formed of relatively thin sheets of transparent or translucent material such, for example, as glass or Celluloid to which the inner and outer concentric opaque rings may be applied in any suitable manner.

I claim:

1. In a signaling device of the class described, a grounded lamp casing, a plurality of lamps within the casing, individual resilient holding members for some of the lamps, said members being insulated from the casing and with the lamps corresponding thereto forming units for insertion within and withdrawal from the casing, supporting devices within and insulated from the casing corresponding to each of the units and adapted to receive opposite portions of the holding members when positioning units within the casing, one terminal of each of the last-mentioned lamps contacting the holding member of the lamp and the other engaging the casing and causing the lamps to exert pressure on the resilient holding members whereby to urge the opposite portions thereof into engagement with the supporting devices corresponding thereto, and oppositely disposed indicia in connection with the casing adapted to form oppositely disposed operating signals each corresponding to certain of the lamps within the casing.

2. In an electric signaling device, a grounded lamp casing, said casing also having a plurality of indicia at opposite sides thereof, constituting signaling elements, a plurality of lamps within the casing corresponding to each of the indicia, individual resilient holding members for some of the lamps said members being insulated from the casing and forming with the lamps corresponding thereto units for insertion within and removal from the casing by a sliding movement substantially parallel to the axis of the casing, and supporting devices within and insulated from the casing corresponding to each of the units and adapted to receive opposite portions of the

holding members slidably in position, one terminal of the lamp of each unit contacting its corresponding holding member and the other terminal engaging the casing and causing the lamp to exert pressure on the holding member whereby to urge the opposite portions thereof into engagement with the supporting devices corresponding thereto.

3. In a signaling device of the class described, a grounded lamp casing, partition members insulated from said casing and dividing the casing into a plurality of pockets, a lamp mounted within the casing on each of a plurality of said partition members and extending within the pocket corresponding thereto and supporting means within and insulated from the casing for each of the last-mentioned partition members on which each is slidably mounted with its corresponding lamp as a unit to position one terminal of the lamp in engagement with the casing.

4. In a signaling device of the class described, a grounded lamp casing, contacts carried by and insulated from the casing, partition means insulated from said casing engaging said contacts and dividing the casing into compartments, a lamp mounted in each of said compartments, means for resiliently maintaining one of the terminals of each of the lamps in engagement with the casing, whereby said casing serves as one side of the circuit, the other terminal of certain of said lamps being connected to the partition means which serves as the other side of the circuit.

5. In a signaling device of the class described, a grounded signal lamp casing, flanged slide contact members fastened on the inner side of and insulated from the casing, resilient plates having their edges positioned against the outer sides of the flanges of said members, a lamp mounted through each of said plates and having its base positioned against the casing so that said plates resiliently urge their edges against said flanges and the lamp base against the casing, each of said plates forming with its corresponding lamp a unit detachably mounted within the casing and each serving to yieldingly maintain one terminal of the lamp mounted thereon in engagement with the casing.

6. In a signaling device of the class described, a grounded lamp casing having contact members fastened on the inside of and insulated from said casing, resilient plates engaging said contact members on the sides facing the casing, a lamp extending through each of said plates and having its base pressing against the casing so as to urge the plates into engagement with the contact members, each of said plates together with its associated lamp being removable from the casing as a unit.

BURGESS W. SMITH.