

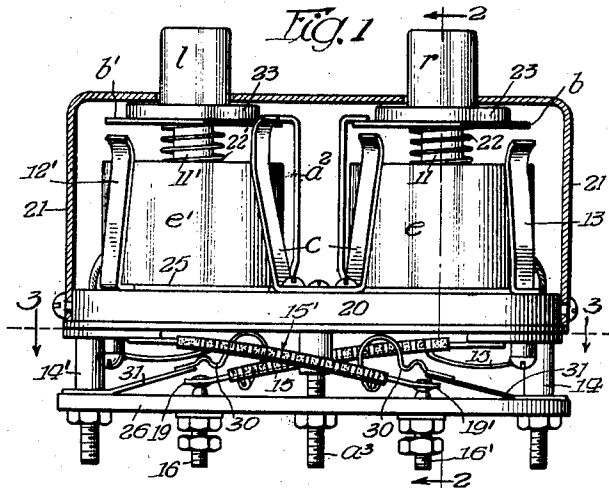
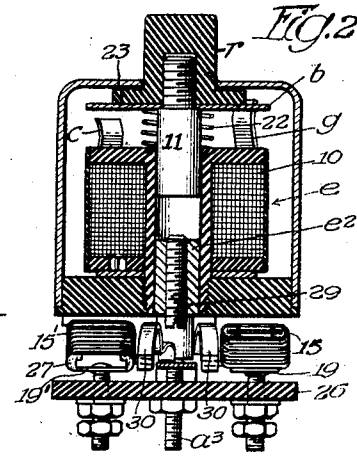
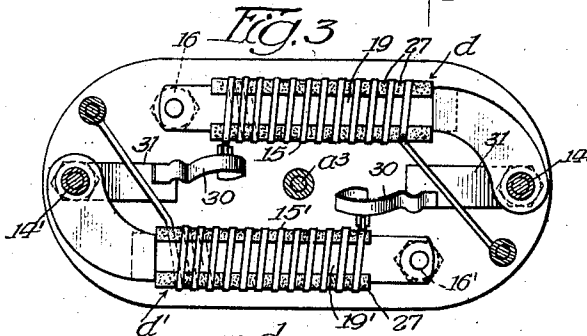
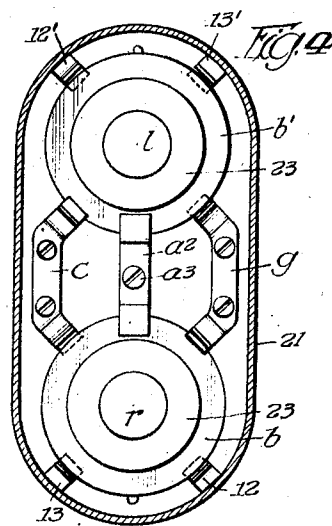
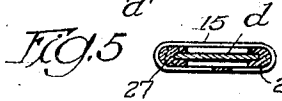
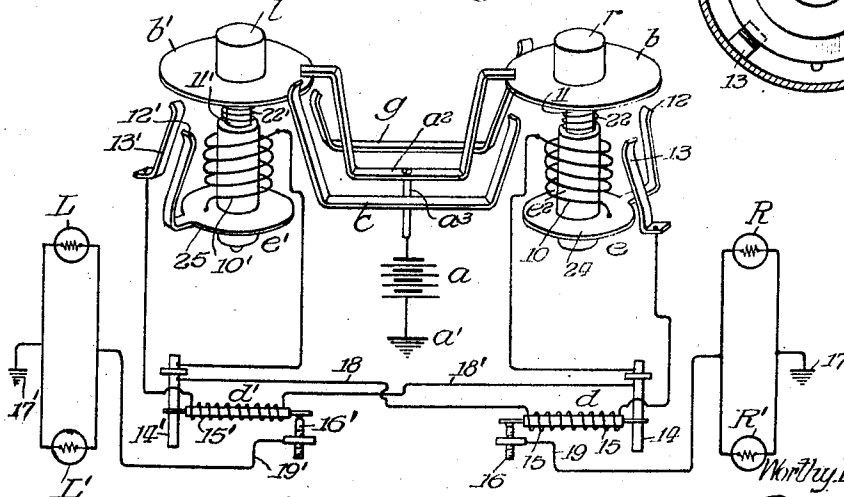
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2,306,590

DIRECTION SIGNALING DEVICE FOR VEHICLES

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UNITED STATES PATENT OFFICE

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DIRECTION SIGNALING DEVICE FOR
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3 Claims. (Cl. 177-339)

The invention relates to direction indicators for motor vehicles.

One object of the invention is to provide simple and efficient means for signaling or indicating to other vehicles when a change in direction of travel is to be made and which is adapted to automatically discontinue the signal at the end of a desired predetermined period so that the operator is not required to perform any manual operation to discontinue the signal when the turn has been made.

Other objects of the invention will appear from the detailed description.

The invention consists in the several novel features which are hereinafter set forth and which are more particularly defined by claims at the conclusion hereof.

In the drawing:

Fig. 1 is a side elevation of a device embodying the invention, the enclosing box being shown in section. Fig. 2 is a section taken on line 2-2 of Fig. 1. Fig. 3 is a section taken on line 3-3 of Fig. 1. Fig. 4 is a plan view, the enclosing box being shown in section. Fig. 5 is a cross-section of one of the thermostatic switches. Fig. 6 is a diagrammatic view illustrating the electrical connections between the parts of the device.

The invention is exemplified in a device comprising a base 20 of insulating material which may be mounted on the instrument panel of the vehicle in any suitable position within convenient reach of the driver. A box 21 is secured to the base 20 and encloses the electromagnets and manually shiftable switch-means. A push-button *r* for controlling the device for signaling a right-hand turn extends through the cover 21. A similar button *l* is provided for controlling the device for signaling a left-hand turn. These buttons are formed of insulating material. Button *r* is secured to the armature 11 of a solenoid magnet *e* and button *l* is secured to an armature 11' of a similar solenoid magnet *e'*. The magnets have soft iron cores *e*². They are respectively provided with coils 10, 10', and these are wound around sleeves of insulating material. Each button and armature is normally pressed outwardly by a spring 22. Each button is provided with a flange 23 inside of box 21. A disk *b* of conducting material, such as copper, is secured between the flange 23 on button *r* and a shoulder on armature 11. A disk *b*¹ is secured to button *l*. These disks, when the buttons are pressed inwardly, are adapted to control the circuits for the actuation of the indicating lamps, respectively, as hereinafter described. A conduc-

tor strip *a*² fixed to a post *a*³ is connected to a battery *a* and has terminals extended to engage both of the disks *b*, *b*¹ when the push-buttons are in normal position. A conductor strip *c* secured to the base 20 has one of its terminals extended to engage disk *b*¹ when button *l* is in its normal position and its other terminal extended to engage disk *b* when button *r* is in its depressed position. A conductor strip *g* secured on the top of base 20 has one of its terminals extended to engage disk *b* when button *r* is in its normal position and its other end extended to engage disk *b*¹ when button *l* is depressed. One end of the coil 10 of magnet *e* is connected to a disk 24 which is provided with a contact-strip 12 which has its terminal extended to be engaged by disk *b* when the latter is in its shifted or depressed position. The other end of coil 10 is electrically connected to a screw-post 14, the end of which is secured and passes through base 20. One end of the coil 10' of magnet *e'* is connected to a disk 25 which is provided with a contact strip 12' which is adapted to be engaged by the disk *b*¹ when button *l* is in its shifted or depressed position. The other end of coil 10' is electrically connected to a screw-post 14', the upper end of which is secured in base 20.

A thermostatic strip *d* has one of its ends fixed and electrically connected to the post 14. The free end of strip *d* normally engages a contact-screw 16 which extends through and is adjustably secured in a panel 26 of insulating material, in spaced relation from the base 20 by posts 14, 14' which are secured in panel 26. A thermostatic strip *d'* has one of its ends fixed to screw-post 14', the upper end of which is secured in base 20. The free end of strip *d'* normally engages a contact-screw 16' which extends through, and is adjustably fixed in panel 26. Contact-screw 16 is electrically connected by conductor 19 (Fig. 5) to a pair of electric signaling lamps which are located at the right-hand side of the vehicle, one being usually mounted adjacent the front of the vehicle and the other at the tail of the vehicle, these lamps being connected to ground, as at 17. Contact-screw 16' is connected by a conductor 19' to indicating lamps *L*, *L'*, which are usually located adjacent the front and the tail of the vehicle respectively and at the left-hand side of the vehicle and these lamps are connected to ground, as at 17'.

A coil 15 is wound around thermostatic strip *d* for heating said strip. One end of coil 15 is connected to a contact 13 which is fixed to base

20 and has a terminal adapted to be engaged by disk *b* when button *r* is pressed into its shifted position for establishing a circuit through said coil. The other end of coil 15 is connected by a conductor 18 to screw-post 14'. A coil 15' is wound around, and is adapted to heat thermostatic strip *d'* and has one of its ends connected to a contact strip 13' which is mounted on base 20 and has its terminal extended to be engaged by disk *b'* when button *l* is pressed into its shifted position. The other end of coil 15 is connected by a conductor 18' to screw-post 14. The wire of the coils 15, 15' is wrapped around strips of asbestos 27 which are folded around the edges of the thermostatic strips so that the portions of the coil between the strip will be spaced from the thermostatic strips to retard the heating of the latter and to expedite cooling when the current is cut off. These thermostatic strips are formed of suitable metal which will cause them to flex when heated to separate their free ends from the contact-screws with which they are normally engaged and so that when cooled they will flex back into engagement with said contacts, as well understood in the art. The ends of the heating coils around the thermostatic strips are respectively connected by flexible strips 30 to rigid strips 31 which are connected to the posts 14, 14', respectively.

Each of the cores *e*² of the solenoid magnets is provided with a screw 29 of non-magnetic material which is adapted to hold the armature slightly spaced from the core *e*² when the solenoid magnet is energized, to avoid excessive pull on the armature and permit free release of the buttons at the end of a signaling operation. Adjustment of screw 29 varies the magnetic flux for rendering the core sensitive to variations in the flow of current resulting from inoperativeness of a lamp.

Motor vehicles are usually equipped with a 6-volt battery and, by way of an example, the coils of the solenoid magnets *e*, *e'* may be wound with about 75 turns of No. 19 double enameled wire. Each of the heating coils 15, 15' may consist of about 11 convolutions of $\frac{1}{16}$ " x .005" flat Ni-chrome wire having a resistance of 3.6 ohms per foot. These coils will result in heating the thermostatic strips sufficiently to break the circuits at contact-screws 16, 16', respectively, at the end of a period of approximately 15 seconds. The signaling lamps usually require 6 amperes each for actuation. The resistance of coils *d*, *d'* reduces the amperage of the current to say, 2 amperes so that the current passing to ground from said coils will be insufficient to actuate the lamps which are not signaling. In the event that a lamp is burned out or removed in the circuit established by the pressing of a button for a signal, the flow of current through coils 10, 10' is reduced so that the amperage of the current flowing through the coils will be insufficient to retain the armature of said magnet associated with that button in its shifted position and the switch-button will be returned to its normal position as an indication to the driver that the desired signal has not been given.

The buttons *l* and *r* are normally pressed and held in their outer position by springs 22', 22, respectively. When it is desired to indicate a right-hand turn, the operator will press button *r* against the force of spring 22. That will establish the following circuit through front and rear lamps R, R', viz.: battery *a*, post *a*³, conductor-strip *a*², disk *b'* on button *l*, conductor-strip *c*, 75

disk *b* on button *r*, contact-strip 12, coil 10 of magnet *e*, post 14, thermostatic strip *d*, contact-screw 16, conductor 19, lamps R, R' and ground at 17. Magnet *e* will be energized and armature 11 will then be attracted and hold button *r* in its shifted position so that disk *b* will be held in engagement with conductor-strip *c* and contact 12 to keep this lamp circuit closed for a predetermined period. Simultaneously a circuit will be established through coil 15 around thermostatic strip *d* as follows: battery *a*, post *a*³, conductor-strip *a*², disk *b'*, conductor-strip *c*, disk *b*, contact strip 13, coil 15 around strip *d*, conductor 18, post 14', thermostatic strip *d'*, contact-screw 16', conductor 19', lamps L and L' through ground at 17'. The resistance in the coil 15 around thermostatic strip *d* will reduce the amperage of the current through conductor 18 so that it will be insufficient to actuate lamps L, L'. The coil 15 around thermostatic strip *d* will slowly heat strip *d* until it has expanded and flexed sufficiently to move its free end out of contact with adjustable screw-contact 16. This will interrupt the circuit through coil 10 of magnet *e*. Thereupon spring 22 will restore button *r* and disk *b* to their normal position and will disconnect disk *b* from contact-strips 12, 13 and conductor-strip *c*. As a result, the lamps R, R' will be actuated for the desired predetermined period to indicate the turn contemplated and for a sufficient period to make the turn and will then be automatically extinguished. By reason of the rapid cooling of the thermostatic strip *d*, when the current through the winding 15 is discontinued, said strip will quickly flex back into engagement with contact 16 for a succeeding operation.

When it is desired to signal a left-hand turn the operator will press button *l* against the force of spring 22' which will establish the following circuit through front and rear lamps L, L', viz.: battery *a*, post *a*³, conductor-strip *a*², disk *b* on button *r*, conductor-strip *g*, disk *b'* on button *l*, contact-strip 12', coil 10' of magnet *e'*, post 14', thermostatic strip *d'*, contact-screw 16', conductor 19', lamps L, L' and ground at 17'. Armature 11' will then be attracted and held by the energization of coil 10' and hold button *l* in its shifted position so that disk *b'* will be held in engagement with conductor-strip *g* and contact-strips 12' and 13' to keep this lamp circuit closed for a predetermined period. Simultaneously a circuit will be established through coil 15' around thermostatic strip *d'* as follows: battery *a*, post *a*³, conductor-strip *a*², disk *b*, contact-strip *g*, disk *b'*, contact-strip 13', coil 15' around thermostatic strip *d'*, conductor 18', post 14, thermostatic strip *d*, contact-screw 16, lamps R, R' to ground at 17. The resistance of coil 15' around thermostatic strip *d'* will reduce the amperage of the current through conductor 18' so that it will be insufficient to actuate lamps R, R'. As the flow of current through winding 15' generates heat the thermostatic strip *d'* will flex away from contact-screw 16' and interrupt at contact-screw 16', the flow of current to lamps L, L' at the end of the desired predetermined period and discontinue the signal for the left-hand turn. The circuit through the coil 10' of magnet *e'* will also be interrupted so that disk *b'* will be separated from conductor-strip *g* and contacts 12', 13'. Spring 22 will then shift button *l* to its normal position. As soon as strip *d'* becomes cool it will again engage contact-screw 16' for a succeeding operation.

In the event that one of either pair of indicator lamps should be burned out, the current drawn by the other lamp of the same pair and thus the current through the coil of the electromagnet to which it is connected will be reduced as compared with the current drawn when both lamps are in operation. Accordingly, the electromagnet will not have a sufficiently great force of attraction to retain the contact disk associated therewith in its shifted position, and, as a result, the button to which the disk is attached will be returned to its normal position by the action of its associated spring and be an indication to the operator that the lamp is not actuated. Similarly, if both lamps of either pair are displaced or burned out, the button which has been operated to cause their actuation will not be held in its shifted position by the magnet.

When it is desired to change an indication made, either on account of error or by reason of a necessitated change in the direction of the vehicle, it is only necessary to depress the button which has remained in its normal position for the corrected indication. This results from the interconnections between the disks *b*, *b*¹, because the depressed disk receives current through the disk which has remained in its normal position. For example, while button *r* is depressed to indicate a right turn, the depression of button *l* will open the circuit from battery *a* to disk *b* at disk *b*¹ and strip *a*². This will cause the magnet 10, 11 to release button *r*. Disk *b* will then engage strip *a*² for current from disk *b* and strip *g* to disk *b*¹ for a left hand indication. By connecting the thermostatic heating coils in the manner described, the lamps which are not actuated reduce the flow of current through the heating coil for the circuit which controls the actuated lamps.

While the invention has been described in connection with the automatic termination of signals at the end of fifteen seconds, it will be understood that by adjustment of screws 16, or proper variations in the construction of heating coil and thermostatic strips, the duration of the signals may be varied to maintain them for longer or shorter periods.

The invention exemplifies direction-signaling apparatus which is simple in construction and whereby the signals will be automatically disconnected at the end of predetermined periods.

I claim:

1. In a self interrupting direction signaling system for vehicles, the combination with signal lamps for indicating different directions of travel, a pair of manually shiftable buttons, spring means for holding the buttons in their normal positions, electromagnets for respectively holding the buttons in their manually shifted position, conductors on the buttons, respectively, and a source of current, of a conductor strip connected to the source of current and for engaging both conductors on the buttons when they are in their normal position, circuits for controlling the actuation of the lamps, each of said circuits comprising a conductor between the conductor on one button when the latter is in its normal position and the conductor on the other button when the latter is in its shifted position, a switch contact engageable

by the conductor on a button when it is in its shifted position and connected to one electromagnet, a conductor between one magnet and one signaling lamp, and a thermostatic switch for interrupting the circuit between the magnet and a lamp, and circuits for shifting the thermostatic switches, each comprising a contact engageable with a conductor on one button which has been shifted from its normal position.

2. In a self interrupting direction signaling system for vehicles, the combination with signal lamps for indicating different directions of travel, a pair of manually shiftable buttons, spring means for holding the buttons in their normal positions, electromagnets for respectively holding the buttons in their manually shifted position, each electromagnet comprising a coil and an armature fixed to and slidable with one of the buttons, disks on the buttons, respectively, and a source of current, of a conductor strip connected to the source of current and for engaging both disks on the buttons when they are in their normal position, circuits for controlling the actuation of the lamps, each of said circuits comprising a conductor between the disk on one button when the latter is in its normal position and the disk on the other button when the latter is in its shifted position, a switch contact engageable by the disk on a button when it is in its shifted position and connected to one electromagnet, a conductor between one magnet and a signaling lamp, and a thermostatic switch for interrupting the circuit between the magnet and a lamp, and circuits for shifting the thermostatic switches, each comprising a contact engageable with a disk on a button which has been shifted from its normal position.

3. In a self interrupting direction signaling system for vehicles, the combination with signal lamps for indicating different directions of travel, a pair of manually shiftable buttons, spring means for holding the buttons in their normal positions, electromagnets for respectively holding the buttons in their manually shifted position, conductors on the buttons, respectively, and a source of current, of a conductor strip connected to the source of current and for engaging both conductors on the buttons when they are in their normal position, circuits for controlling the actuation of the lamps, each of said circuits comprising a conductor between the conductor on one button when the latter is in its normal position and the conductor on the other button when the latter is in its shifted position, a switch contact engageable by the conductor on a button when it is in its shifted position and connected to one electromagnet, a conductor between one magnet and one signaling lamp, and a thermostatic switch for interrupting the circuit between the magnet and a lamp, and circuits for shifting the thermostatic switches, each comprising a contact engageable with a conductor on one button which has been shifted from its normal position, the electromagnet being connected in series with the respective lamps and being responsive to the amperage flow when the lamps are actuated, and non-responsive to substantially less amperage.

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