June 13, 1939. A. B. COTANT 2,162,161

ELECTRIC SIGNAL FOR MOTOR VEHICLES

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Fig. 1

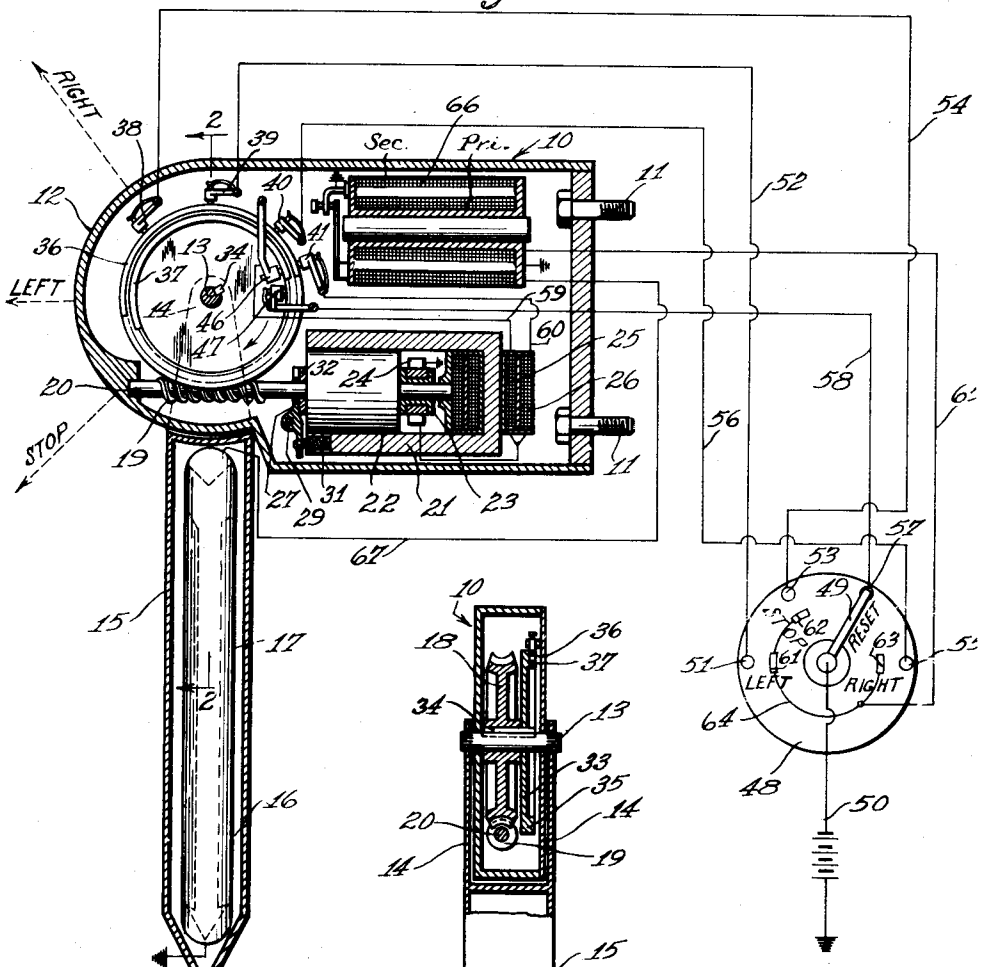


Fig. 2

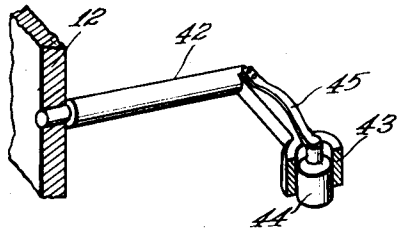


Fig. 3

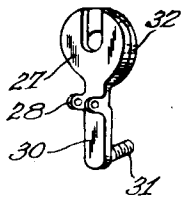


Fig. 4

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ELECTRIC SIGNAL FOR MOTOR VEHICLES

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1 Claim. (Cl. 177—327)

This invention relates to electric signals for motor vehicles and has for an object to provide a signal arm which is moved to various adjusted positions by a reversible motor so that the action is positive and does not depend upon gravity or manual operative means for lowering the arm since, when the motor is reversed, the arm is lowered by the power of the motor.

A further object is to provide a spring pressed fork for checking and stopping the rotor of the motor so that the signal arm will stop in the correct position and will not be carried past the desired position by the momentum of the armature as the circuit is broken.

A further object of the invention is to provide a transformer for energizing a neon lamp in the signal arm the transformer making it possible to use low voltage current on the switch between the current supply and the neon tube.

A further object is to provide a signal device of this character which is held in adjusted position by a worm shaft and worm wheel which operate the signal arm.

A further object is to provide a signal device of this character which is electrically controlled and can be mounted at any place on a vehicle and controlled by a manually operable switch, the device being formed of a few strong simple and durable parts, being inexpensive to manufacture, and not susceptible of easily getting out of order.

With the above and other objects in view the invention consists of certain novel details of construction and combinations of parts hereinafter fully described and claimed, it being understood that various modifications may be resorted to within the scope of the appended claim without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawing forming part of this specification,

Figure 1 is a longitudinal sectional view of a signal device constructed in accordance with the invention and showing the electrical wiring thereof diagrammatically.

Figure 2 is a longitudinal sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a detail perspective view of one of the brushes.

Figure 4 is a detail perspective view of the brake which stops rotation of the motor armature after each actuation.

Referring now to the drawing in which like characters of reference designate similar parts in the various views, 10 designates a casing which may be attached to the side of a motor vehicle by screws 11, one end of the casing being rounded as shown at 12. A shaft 13 is rotatably mounted in openings formed at the center of the sides of the rounded portion of the casing. The ends of the shaft are roughened, as shown in Figure 2, and the roughened ends project beyond the sides of the casing. The roughened ends of the shaft are rigidly secured to ears 14 which project from a hollow signal arm 15. Thus when the shaft is rotated the signal arm is moved as a unit therewith.

A neon lamp 16 is mounted in the signal arm and the sides of the signal arm are cut away to form arrows 17 and these cut away portions may be covered with colored Cellophane or other transparent material if desired. Thus when the neon lamp is energized the arrows are illuminated to attract attention to the signal lamp.

A worm wheel 18 is keyed to the shaft 13 and meshes with a worm 19 on a worm shaft 20. The worm shaft forms part of the armature shaft of a reversing motor, the poles 21 of which are U-shaped and are fixed to the casing in any preferred manner. An armature 22 is rotatably mounted between the poles and carries the usual commutator 23 and brushes 24. A field coil 25 is wound around the transverse member of the pole piece and a second field coil 26 is wound upon the first field coil, and in a direction opposite to the winding of the first field coil. Thus when current is supplied to one of the coils the armature will be rotated in one direction to drive the worm wheel 18 clockwise to move the signal arm 15 upwardly and when current is supplied to the other coil the armature will be rotated in a retrograde direction to return the signal arm to neutral position, as best shown in Figure 1, after each operation.

A metal yoke 27 straddles the worm shaft 20 and is provided with hinge eyes 28 through which a pivot pin 29 is passed to pivotally connect the yoke to the sides of the casing. The yoke is provided with a depending lug 30 which extends downwardly over one of the legs of the pole piece 21 and is constantly pushed outwardly by a spring 31 so that the yoke will forcibly engage an insulating washer 32 on the armature 22 and stop rotation of the armature suddenly after each actuation. When the field coils are energized the lug 30 is attracted by the pole piece so that the spring will be compressed and the yoke will be freed from engagement with the washer 32 so that there will be no drag on the free rotation of the armature when current is supplied to either of the field coils.

An insulating disc 33 is keyed to the shaft 13 by the same key 34 which keys the worm wheel 18 to the shaft. The disc is provided with a flange 35 on one side. An arcuate switch contact 36 is countersunk in the outer periphery of the flange and extends for substantially an angular distance of 180 degrees around the flange. A second arcuate switch contact 37 is countersunk in the inner periphery of the flange and ex-

tends for a slightly greater angular distance around the flange than the switch contact 36.

Four switch contacts designated in general by the numerals 38, 39, 40 and 41 are secured to the side wall of the rounded portion of the casing at an angular distance of about 45 degrees apart as shown in Figure 1. Each contact comprises an angular arm 42 which is rigidly secured to and projects from the side of the rounded portion 12 of the casing, as best shown in Figure 3. The arm terminates in a brush holder 43 in which a brush 44 is slidably fitted and is held pressed downward upon the outer switch contact 36 by a leaf spring 45.

A pair of switch contacts designated in general by the numerals 46 and 47, and similar to the switch contacts previously described, are mounted on the casing and engage the inner annular switch contact 37.

Mounted within convenient reach of the driver of the vehicle is a switch 48 having a movable contact arm 49 which is connected by a wire 50 to one terminal of the battery, the other terminal of the battery being grounded. The contact arm rotates in an arc of 360 degrees and may be manually moved over the switch contacts as follows. A switch contact 51 is connected by a wire 52 to the switch contact 39 on the insulating disc 33, the switch contact 39 corresponding to an intended left turn. A switch contact 53 is connected by a wire 54 to the switch contact 38 on the insulating disc, which contact corresponds to an intended stop. A switch contact 55 is connected by a wire 56 to the switch contact 40 on the insulating disc corresponding to an intended right turn. A switch contact 57 is connected by a wire 58 to the switch contact 47 which has wiping engagement with the inner arcuate switch contact 37 of the insulating disc, the contact 57 controlling reversing of the motor to return the signal arm to reset position after each operation.

For controlling rotation of the motor to rotate the insulating disc 33 clockwise, to swing the arm to its various signalling positions, a wire 59 is connected to the switch contact 46 that also rides upon the inner arcuate switch contact 37 and is connected to the inner field coil 25. A wire 60 is connected to the remaining switch contact 41 which rides upon the outer arcuate switch contact 36 of the insulating disc and is connected to the outer field coil 26.

When the rotary switch contact arm 49 is manually moved to engage the switch contact 51, for example, on the base 48 a circuit may be traced from the battery through the wire 50, arm 49, contact 51, wire 52, contact 39, outer arcuate contact 36, contact 41, wire 60, outer coil 26 of the motor, and commutator to the ground. Thus the motor is started and through the worm gear 19 and worm wheel 18 rotates the disc 35 and at the same time carries the signal arm 15 upwardly. During rotation of the disc clockwise the arcuate outer contact 36 will ride from underneath the contact 39 thereupon breaking the circuit through the motor. When the motor stops the arm is locked in position to indicate a left turn, as indicated by the legend on Figure 1 and is locked stationary in this position by the meshing worm pinion 19 and worm wheel 18.

When the driver wishes to reset the arm after completing the left turn the rotary switch arm 49 is moved into contact with the switch contact 57 on the switch 48. Thereupon a circuit may be traced from the battery through the wire 50, arm 49, contact 57, wire 58, contact 47, inner arcuate contact 37, contact 46, wire 59, inner field coil 25 of the motor, commutator 23 of the motor to the ground. Thus the rotation of the motor will be reversed to simultaneously move the insulating disc 33 and the signal arm 55 in a retrograde direction to reset position ready for the next operation.

To make a right turn the driver moves the rotary contact arm 49 into engagement with the contact 55 on the switch 48. To indicate a stop the driver moves the switch arm 49 into engagement with the switch contact 53 on the switch 48. For the purpose of brevity the circuits, above described and clearly shown on the drawing, will not be now described since a description of the operation to indicate a left turn has been fully described and will suffice for the right turn and the stop operations.

In order that the neon lamp 17 will be energized when the left, right and stop signal circuits are selectively closed, three switch contacts 61, 62 and 63 are arranged on the switch 48 to align respectively with the switch contacts 51, 53 and 55 so that when the arm is swung selectively to engage any one of the latter named contacts it will also engage the associated inner switch contact. The inner switch contacts 61, 62 and 63 are connected in series by a wire 64 and a wire 65 connects the wire 64 with the primary wiring of an induction coil 66 which is located in the casing 10. When the arm 49 is swung to engage the left turn contact 51, for example, it will also engage the associated inner contact 61 to close a circuit from the battery through the primary winding of the induction coil. The secondary widing of the induction coil, or high tension side, is connected by a wire 67, to one terminal of the neon lamp 17 while the other terminal of the lamp is grounded. In this manner each time the rotary contact arm 49 is adjusted to close a circuit through the motor to move the signal arm 15 to an intended turn indicating position the neon lamp will be simultaneously energized to attract attention.

From the above description it is thought that the construction and operation of the invention will be fully understood without further explanation.

What is claimed is:

In a signal device, a casing, a shaft projecting through the casing, a signal arm secured to the end of the shaft, a motor in the casing having a shaft geared to the first named shaft, a pivoted brake having a forked end straddling the motor shaft, an insulating washer on the motor shaft forming a friction disc against which the forked end of the brake engages for stopping rotation of the motor, the motor having a field core, a lug on the brake projecting across the field core, said lug forming an armature adapted to be attracted by the core when the motor is energized to disengage the forked end of the brake from the friction disc to permit the motor armature to rotate, and a spring engaged between the lug and the core and normally holding the forked end of the brake engaged with the friction disc.

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