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VEHICLE DIRECTION INDICATOR

Filed Aug. 19, 1937

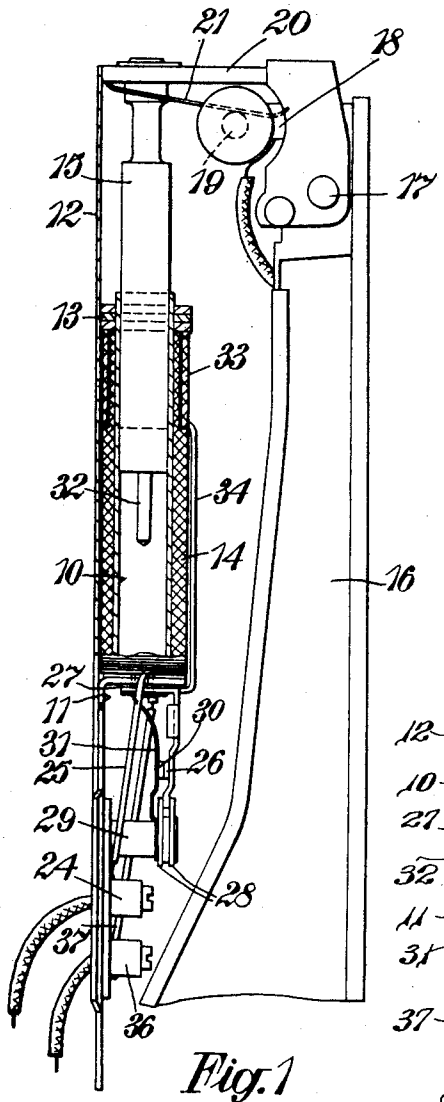
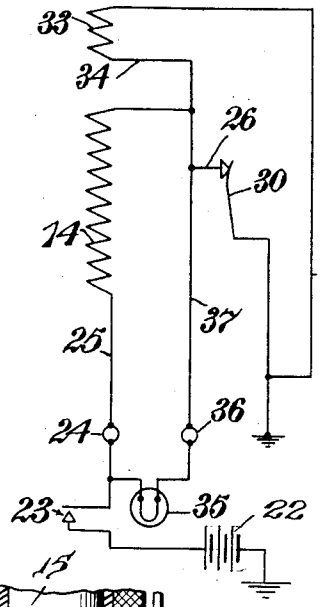


Fig. 1

Fig. 2



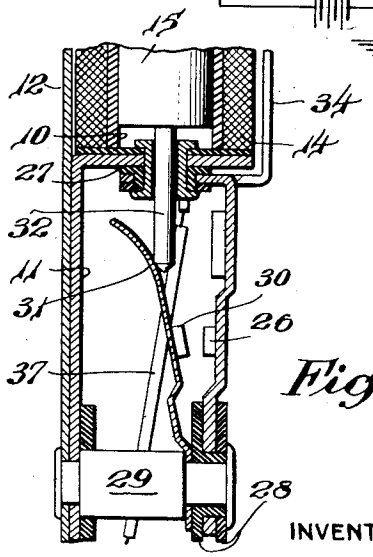


Fig. 3

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VEHICLE DIRECTION INDICATOR

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7 Claims. (Cl. 177—329)

This invention relates to vehicle direction indicators comprising an indicating member, semaphore arm or the like which is pivotally or otherwise mounted and adapted to be swung upwardly or moved to an indicating or display position by the displacement of the core of a solenoid device. In particular the invention may be applied to electrically operated vehicle direction indicators such as described in British Patent No. 435,803.

An object of the present invention is to provide improved means adapted to enable economy of current by employing a reduced current for holding or maintaining the indicating member in display position and thus avoid utilising the full operating current adapted to raise or display the indicating member for longer than is necessary.

A further aim of the invention is to provide an arrangement for giving an auxiliary or warning signal when the apparatus is out of order and which utilises appreciable current only when the indicating member fails to be displayed.

The invention consists in the provision, in a direction indicator of the character described, of switch means actuated by movement of a part of the device arranged to introduce a resistance for reducing the current taken by the circuit or circuits of the operating coil and/or an auxiliary or indicating circuit associated with the device, when the direction indicating member is moved to the displayed position.

The introduced resistance may comprise an auxiliary coil in series with the operating coil and acting as an additional holding coil for the actuated member or core of the device.

According to a feature of the invention the resistance is adapted to be introduced into the circuit of a visible or audible warning device such as a lamp or buzzer whereby said device is extinguished, dimmed or ceases under normal conditions when the indicating member is properly functioning but is fully operated when the indicating member fails to be displayed.

A convenient embodiment of the invention is illustrated in the accompanying drawing in which:

Figure 1 is a side elevation partly in section of a solenoid operated device, and

Figure 2 is a wiring diagram.

Figure 3 is an enlarged cross section of the lower portion of Fig. 1 with solenoid core **32** in its lower position.

In carrying the invention into effect according to one convenient mode illustrated in the drawing the former or bobbin **10** of the solenoid winding is mounted at its lower end on a supporting bracket or frame element **11** and has a connection for earthing at its upper end to the frame **12** conveniently provided by washers **13** secured to the former **10**. The former is wound with a main solenoid coil **14** which conveniently is coiled back upon itself to bring the two ends of the wire towards the supporting bracket end of the former **10**. The core **15** of the solenoid is adapted to actuate any suitable means for raising or displaying the indicating member. As shown, the indicating member or semaphore arm **16** is pivotally mounted on a fixed pin **17** and normally hangs in the vertical position. The arm **16** carries a short lever or projection **18** provided with a pin or abutment **19** adapted, when the core **15** is drawn downwardly, to be engaged by an actuator bar **20** secured to the upper end of the core **15** to effect swinging of the arm **16** about its pivot **17** into the indicating or displayed position. For preventing swinging of the arm or locking it in its inoperative position a light spring **21** is provided which is mounted on the bar **20** and engages the pin **19** thereby raising the bar off the pin **19** into engagement with a suitable part of the arm.

The positive side of the battery **22** is connected through the manually operable indicator switch **23** to an insulated terminal **24** connected with one end of the main coil **14** of the solenoid by wire **25**. The other end of the main coil is connected to the fixed contact **26** of a core operated switch device which fixed contact is mounted on insulated parts **27** and **28** attached respectively to the bracket **11** and a post **29**. The movable contact **30** of the switch is carried by a spring member **31** mounted on the post **29** which is secured to the bracket **11** forming the earth or return terminal of the battery circuit and lying in the path of a reduced portion **32** of the solenoid core **15**, so that the latter in being retracted into the solenoid winding acts to separate and open the switch contacts **26**, **30** and disestablish the connection.

Upon the bobbin or former **10** and in longitudinal extension of the main coil **14** an auxiliary coil or resistance **33** is wound, one end being united to the washers **13** for earthing or battery return through the frame **12** with which the washers contact, while the other end **34** of the coil is connected to the switch end of the main coil or directly to the fixed contact **26** of the switch so that the current when the switch has been opened by the retraction of the solenoid core, flows through the main and auxiliary coils **14**, **33** in series to earth, while when the core actuated switch **26**,

30 is closed the current flows through the main coil 14 directly to earth through the switch.

An auxiliary signal lamp 35 is provided, preferably in association with the indicator switch 23 of the installation, and this includes in its circuit the core actuated switch 26, 30 above referred to so that as the indicator switch 23 is operated the lamp 35 is illuminated but only for the period during which the core actuated switch 26, 30 remains closed. Thus for example, the lamp circuit is connected to a terminal 36 secured to but insulated from the former bracket 11, which in turn is connected by wire 37 to the fixed contact member 26 of the core actuated switch.

It will thus be appreciated that when the core 15 is retracted and opens the switch 26, 30 the auxiliary signal lamp current will pass through the auxiliary solenoid winding 33 and, consequently, either fail to be illuminated or will be only dimly illuminated. In these circumstances it will be understood that when the indicator switch 23 is operated the auxiliary signal lamp 35 will flash on for a moment but if the conditions are normal and the core 15 of the solenoid, the movement of which causes the display of the signal member 16, is retracted, the core actuated switch 26, 30 opens and the resistance of the auxiliary winding 33 is introduced and the lamp is immediately extinguished or dimmed. This effect will indicate to the driver or operator that conditions are normal and that the device is operating. Should, however, the core 15 fail to be retracted or be retracted insufficiently, the core actuated switch 26, 30 will remain closed and the lamp 35 will continue to burn brightly, notifying the driver or operator that a fault has occurred.

Instead of employing an illuminated signal an audible warning device such as a buzzer may be used, in which case when the indicator member is functioning the warning is inoperative but becomes operative if the indicator member fails.

It will be appreciated that the invention is not limited to the particular form of core actuated switch described as in substitution therefor a switch actuated by another critical moving part of the device might be employed. Similarly, the invention is not confined to the particular arrangement of the windings described so long as the auxiliary winding is brought into operation after the main current has served its purpose in supplying the power for displaying the indicating member. In place of the auxiliary coil any suitable resistance may be used such as a nickel chromium wire, and placed in any suitable position. The resistance may be enclosed in the indicating arm with the lamp and be connected in parallel or in series with said lamp. In the latter case should the lamp in the indicating arm burn out the warning signal at the operating switch would operate to show that the signalling system was not working properly although the indicating arm might be in the raised position giving a non-illuminated signal. Also, in place of the auxiliary coil or resistance the lamp in the indicating arm may be connected in series with the main coil through the core-actuated switch to act as the resistance and so effect the reduction in current consumption when the arm is raised.

The switch 23 for operating the indicator by closing the battery circuit may be of any type but preferably includes a time delay arrangement for re-opening the switch after a predetermined interval.

Such time delay arrangements are available in wide variety in the vehicle direction signal art and since the details of operation of the time delay arrangement in and of themselves form no part of this invention, the constructional details are not believed necessary to be set forth. One example of a vehicle direction indicator switch, which is manually operated and subsequently automatically broken by the action of the operator of the vehicle in accelerating the speed, is shown in the patent to John R. Oshei, No. 2,122,891, and dated July 5, 1938.

I claim:

1. In a device of the class described, the combination of a movably mounted indicating member, a solenoid comprising a core and operating coil therefor for moving the indicating member to displayed position, a circuit for the solenoid operating coil, an auxiliary indicating circuit, a lamp in said auxiliary circuit, a normally closed switch common to both of said circuits, and a resistance across the contacts of said switch, said switch being in the path of movement of the solenoid core to be opened thereby when the indicating member is moved to displayed position to introduce the resistance into both of said circuits.

2. In a vehicle direction indicator, the combination of a movably mounted indicating means, a solenoid core for moving the indicating means to displayed position, an operating coil for said solenoid core, a circuit for said operating coil, a normally closed switch in said circuit and a resistance arranged across the contacts of said switch, said switch being opened by movement of the solenoid core and the indicating means to indicating position to bring the resistance into said circuit in series with the solenoid operating coil, said resistance comprising an auxiliary solenoid coil acting when in series with the solenoid operating coil as an additional holding coil for the solenoid core.

3. In an indicating device, the combination of a movably mounted indicating member, a solenoid for actuating said indicating member, an operating circuit for said solenoid and an auxiliary indicating circuit, a lamp in said auxiliary circuit, a normally closed switch common to both of said circuits and a resistance across the contacts of said switch, said switch being adapted to be opened upon movement of said solenoid and said indicating member to operative position to introduce the resistance into both of said circuits, said resistance being so associated with said solenoid as to constitute an auxiliary solenoid coil when the switch is open.

4. In a device of the class described, the combination of a movably mounted indicating member, a solenoid comprising a core and an operating coil therefor for moving the indicating member to displayed position, a circuit for the operating coil and an auxiliary circuit in parallel therewith, an auxiliary indicating means in said auxiliary circuit, a switch common to both of said circuits and a resistance across the contacts of said switch, and means operated when the indicating member is moved to displayed position for operating said switch to place the resistance into series with said circuits.

5. In a vehicle direction indicator, the combination of a movably mounted indicating member, means for moving the indicating member to displayed position, an electrically actuated warning device, a circuit for said warning device, switch means closable to initiate movement of said indicator to displayed position and to activate said warning device, a second switch in series

with said circuit and a resistance arranged across the contacts of said second switch, and means movable when the indicating member is moved to displayed position for opening said second switch to place the resistance into series with the warning device.

6. In a vehicle direction indicator, the combination of a movably mounted indicating member, a solenoid comprising a core and an operating coil therefor for moving said indicating member to displayed position, an electrical circuit for said operating coil, a lamp and an electric circuit therefor, switch means in said lamp circuit adapted to be closed whenever the circuit for said operating coil is closed, a second switch in said lamp circuit and a resistance arranged across the contacts of said second switch, said second switch being adapted to be opened by movement of the indicating member to displayed position to place said resistance into the lamp circuit and reduce the current taken by such circuit.

7. In a vehicle direction indicator, the combination of a movably mounted indicating member, mechanism for moving the indicating member to displayed position, a tell-tale lamp and a circuit therefor, a switch in said circuit adapted to be closed to initiate movement of said indicating member to displayed position, a second switch in said circuit and a resistance arranged across the contacts of said second switch, and means operable by a part of said mechanism for opening said switch when the indicating member is moved to displayed position to place said resistance into the lamp circuit to dim said lamp.

WILLIAM EDWARD OSHEI.