Aug. 25, 1936. R. C. CALE 2,052,080

SIGNALING DEVICE FOR AUTOMOBILES

Filed July 24, 1934 2 Sheets-Sheet 1

FIG. 1.

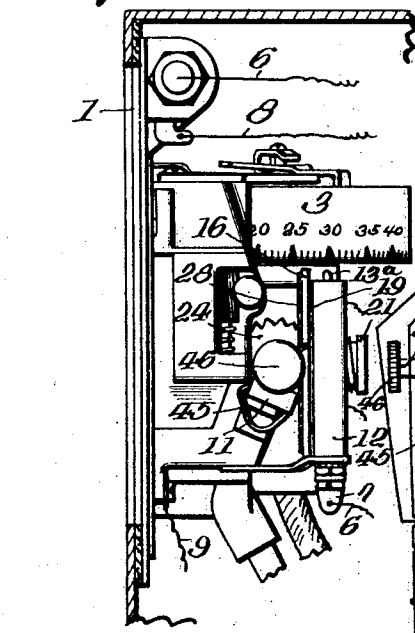
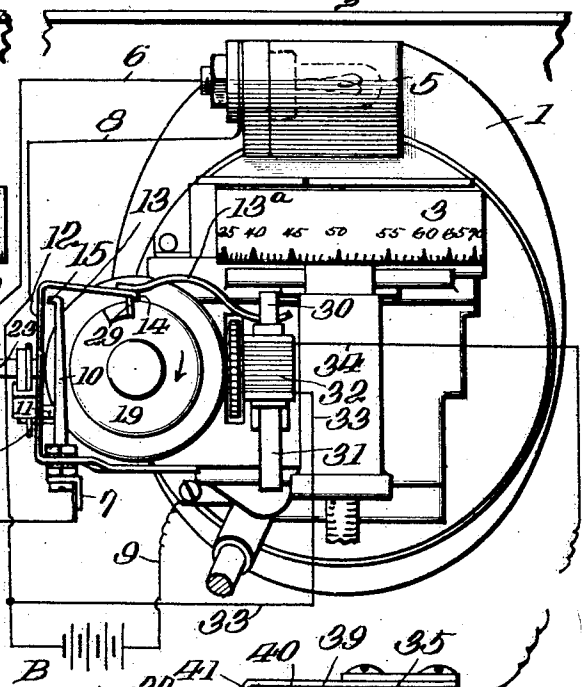


FIG. 2.



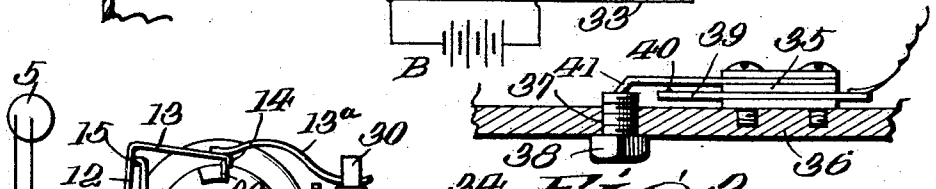
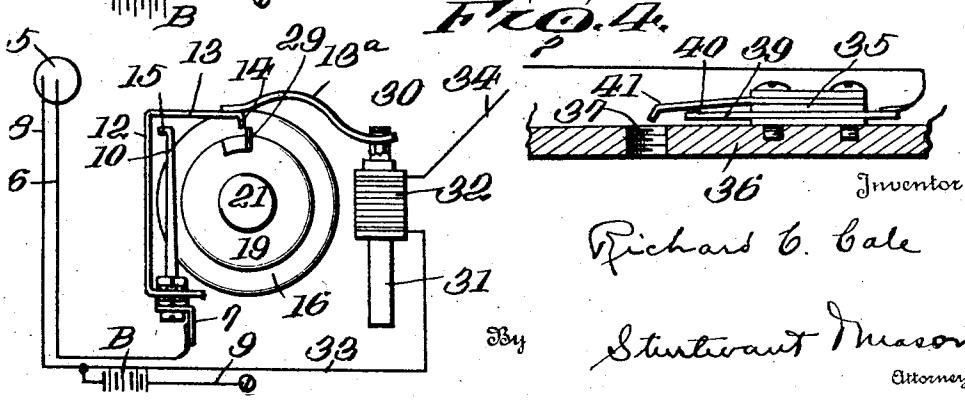


FIG. 3.

FIG. 4.



Inventor

Richard C. Cale

By Sturtevant Mason

Attorneys

Aug. 25, 1936. R. C. CALE 2,052,080

SIGNALING DEVICE FOR AUTOMOBILES

Filed July 24, 1934 2 Sheets-Sheet 2

FIG. 5.

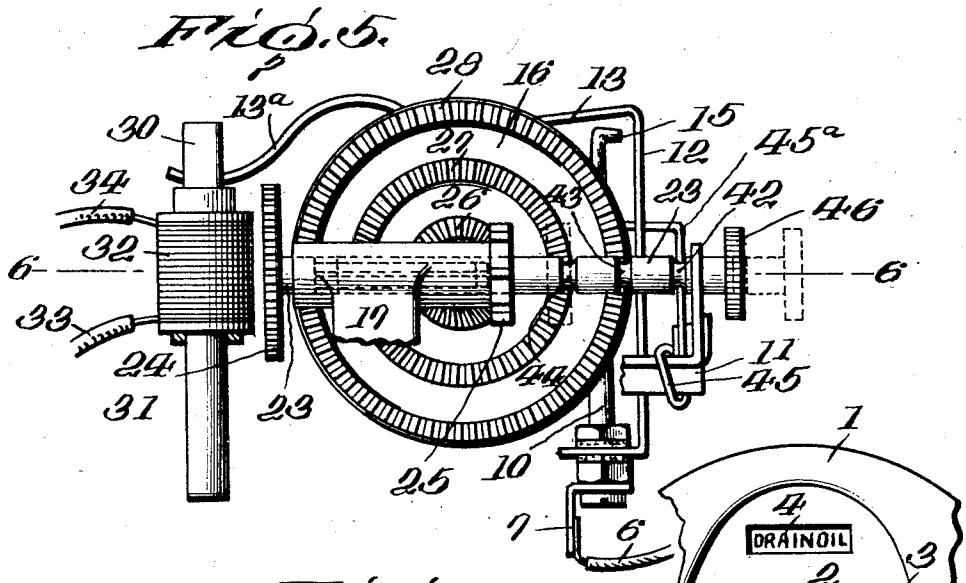


FIG. 6.

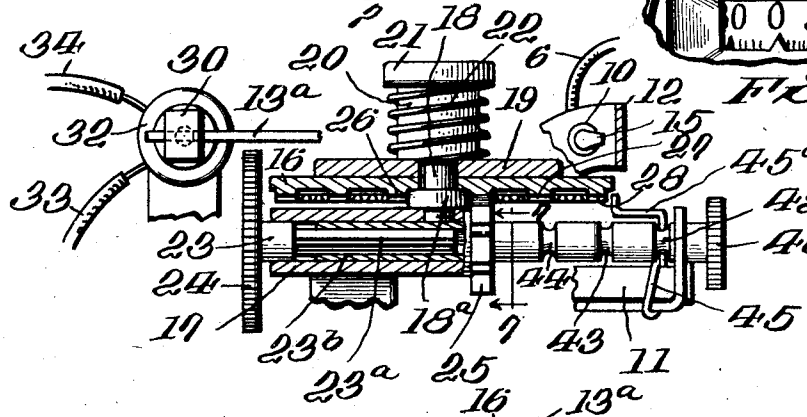
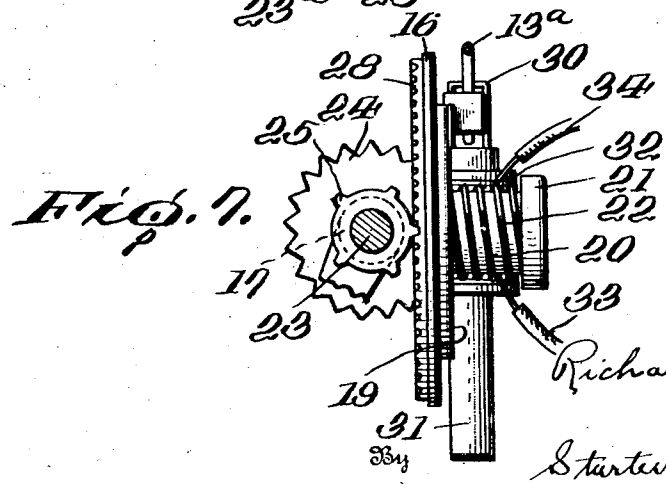


FIG. 8.

FIG. 7.



Inventor

Richard C. Cale

By Starkweather & Mason

Attorneys

Patented Aug. 25, 1936 2,052,080

UNITED STATES PATENT OFFICE

2,052,080

SIGNALING DEVICE FOR AUTOMOBILES

Richard C. Cale, Terra Alta, W. Va.

Application July 24, 1934, Serial No. 736,741

9 Claims. (Cl. 177—311)

The invention relates to new and useful improvements in a signaling device for indicating that the lubricating oil in the crank casing should be changed.

An object of the invention is to provide a signaling device which is associated with the odometer and which is automatically operated when the vehicle has traveled a predetermined distance and wherein said signaling device remains in operation until the oil is drained from the crank casing.

A further object of the invention is to provide a signaling device of the above type wherein the signal is released and re-set for operation when the means for draining the crank casing is opened.

A further object of the invention is to provide a signaling device of the above type wherein the control means for the signaling device automatically stops during the time that the signaling device is in operation.

These and other objects will in part be obvious and will in part be hereinafter more fully described.

In the drawings:

Fig. 1 is a view partly in vertical section and partly in side elevation showing a signaling means embodying the improvements.

Fig. 2 is a rear view of the same; also showing in vertical section a portion of the crank casing and the draining means therefor at the control switch which is associated with the signaling device.

Fig. 3 is a view showing more or less diagrammatically the control means for the signaling device and the means for releasing the signal, the parts being in the position when the signal is closed and being maintained closed.

Fig. 4 is a similar view but showing the opening of the draining means for the crank casing and the actuation of the releasing means for the signal.

Fig. 5 is an enlarged view showing the manner of operating the control mechanism for closing the switch of the signaling device and also the means for releasing the switch.

Fig. 6 is a horizontal sectional view on the line 6—6 of Fig. 5.

Fig. 7 is a sectional view on the line 7—7 of Fig. 6.

Fig. 8 is a view in front elevation showing a portion of the odometer casing and the display openings therein.

The invention has to do with a signaling device associated with a vehicle actuated odometer and actuated thereby when said vehicle has traveled a predetermined distance, as for example, five hundred miles, a thousand miles or two thousand miles. The signaling device is for the purpose of indicating when set in operation, that the predetermined distance has been traveled, therefore the oil in the crank casing should be changed. The control means for the signaling device is so constructed that when the odometer actuates the signal, the signal will be maintained in operation until the means for draining the oil from the crank casing has been opened.

In the present illustrated embodiment of the invention, the signal means is electrically operated and is in the form of a lamp which is viewed through an opening in the face plate of the odometer. The circuit controlling the lamp includes a switch. A control disk frictionally driven by the odometer mechanism will, at the proper time, close the switch and light the lamp. This occurs when the vehicle has traveled a predetermined distance as recorded by the odometer. The means which drives the control disk from the odometer mechanism, is capable of adjustment and may be set for five hundred miles travel, a thousand miles or two thousand miles, as above noted.

When the switch is closed, the control disk is locked against movement and the switch remains closed. There is associated with the switch a solenoid which when energized moves a core piece so as to trip and release the switch. This solenoid is in a circuit controlled by a switch in the crank casing and the switch is only closed when the oil is drained. On the closing of the switch, the solenoid is energized and this will release the switch for the lamp and also restore the switch so that it remains in open position to be closed by the control disk when given an angular movement determined by the odometer. The switch at the crank casing is preferably closed when the draining plug is removed and this switch will be opened when the plug is inserted so that the parts are all restored for the next cycle of operation.

Referring more in detail to the drawings, there is shown more or less diagrammatically, a vehicle actuated odometer which is of the usual construction. The odometer is mounted in a casing shown in part at 1. This casing has a face plate 2 with display openings for the odometer, one of which is indicated at 3 and a display opening 4 for a signaling device. In the present embodiment of the invention, this opening 4 is closed by a transparent material and in rear thereof, is a

lamp. Preferably characters are placed on the transparent closure for the opening, such as "drain oil" for indicating that the signal is for the purpose of calling the operator's attention to the fact that the oil in the crank casing should be drained.

The lamp is indicated at 5 in Fig. 2 of the drawings. Said lamp is mounted in a suitable housing forming a part of the casing for the odometer. A circuit 6 leads from the lamp to a switch terminal 7. A circuit 8 leads from the lamp to the usual source of current for the automobile, which is indicated as a battery B. The other terminal for the battery is grounded to the frame structure, as indicated diagrammatically at 9. The terminal 7 is connected to a rigid post 10, which is mounted on a bracket 11, which is rigidly attached to the casing of the odometer and is connected through the casing in the framework of the machine, to the negative terminal of the battery B. This post 10 extends through the bracket and is supported thereby, but is insulated therefrom.

Mounted on the outer end of the bracket 11, is a flexible arm 12, which extends up alongside the post 10. Said arm is bent laterally so as to provide a horizontal member which extends over the top of the post. At the upper end of the post is a laterally extending contact point 15. As shown in Fig. 2 of the drawings, the flexible arm 12 is out of engagement with the contact point 15. Therefore the circuit from the battery through the lamp is broken. If this arm 12 is bent to the right, it will engage the contact 15 and thus establish a circuit through the lamp and set into operation the signaling device.

The control mechanism for closing the switch includes a disk 16. Said disk is mounted for rotation on the bracket 11. The bracket 11 has an upwardly projecting portion carrying a sleeve 17. Rigid with this sleeve 17 is a stud 18 and the disk 16 is mounted for rotation on this stud. Mounted on the stud 18 is a sleeve 18*a* which holds the disk at a fixed distance from the sleeve 17. Associated with the disk 16 is a control member 19. This control member is also mounted for rotation on the stud 18. At the outer end of the stud is a hub 20, having a flange 21 formed integral therewith. A coil spring 22 surrounding this hub, bears against the control member 19 and forces the same into frictional engagement with the disk 16.

Extending through the sleeve 17 is a shaft 23. Said shaft 23 carries a gear wheel 24 which meshes with one of the gear wheels of the odometer and preferably with the gear wheel of the odometer which registers ten miles for each increment of movement imparted thereto. It may be connected to some other gear of the odometer. It is essential, however, that it shall be operated in timing with the odometer so that when the vehicle travels through a predetermined distance, the shaft 23 will be given a predetermined number of revolutions. When connected to the gear registering for each movement ten miles, then the shaft 23 will be given one rotation when the vehicle has traveled a hundred miles.

The shaft 23 is made in sections which have telescoping engagement with each other. The section at the left carries the gear wheel 24 and is provided with a portion 23*a* which has a rib projecting therefrom. The right-hand section of the shaft 23, has a sleeve 23*b* which has telescoping engagement with the section 23*a* and the rib transmits rotations of the left-hand section to the right-hand section.

Mounted on the right-hand section of the shaft 23, is a gear wheel 25, which as shown has five teeth. On the rear of the disk 16, are three concentric racks indicated at 26, 27 and 28. When the shaft sections are set as shown in Fig. 6, the gear wheel 25 meshes with the rack 26. This rack is preferably provided with twenty-five teeth and as the gear wheel 25 has five teeth, the disk 16 will be rotated once for every five revolutions of the gear 25 and therefore the disk 16 will be rotated once when the odometer parts turn for registering five hundred miles. When the shaft sections are adjusted so as to bring the gear 25 into mesh with the rack 27, then the disk 16 will be rotated once for each thousand miles of travel, as this rack preferably has fifty teeth. When the gear is shifted so as to mesh with the rack 28, which has preferably one hundred teeth, then the disk 16 will be rotated once for each two thousand miles traveled.

Mounted on the control disk 19 is a latch 29. The control disk turns in the direction of the arrow in Fig. 2, and when the latch engages the lip 14, it will carry along with it the arm 12, causing said arm to engage the contact 15. This closes the circuit and lights the lamp. This lip has such a firm hold on the latch that it will stop the rotations of the disk 19 so long as this lip contacts with the latch. Therefore, when the distance of five hundred miles has been traveled, the latch engages the lip, closes the circuit and operates the signal by illuminating the lamp, which indicates to the operator that the oil should be drained. If, however, the operator does not stop at once and drain the oil, the signal will be maintained no matter how long the vehicle is driven thereafter. The signal remains indicating that the oil should be drained until the switch is opened. These parts are all concealed within the casing of the odometer and it is not possible for the operator of the vehicle to reach the switch to release the signal. This is accomplished by another means which will now be described.

Attached to the arm 13 is an extension 13*a*. The extreme outer end of this arm passes through a stirrup 30 mounted on the upper end of a solenoid core 31, which is free to move in a solenoid 32. A circuit 33 leads from the battery to one terminal of the coil of the solenoid. The other terminal of the coil of the solenoid is connected through a line 34 with a switch 35 located in the crank casing, a portion of which is indicated at 36. An oil port 37 is illustrated in the drawings as the draining opening for the crank casing and this opening is closed by the usual plug or closure member 38. The switch 35 includes a metal plate 39 having a contact point 40. This metal plate 39 is insulated from the casing. Associated therewith is a metal plate 41 which is also insulated from the crank casing. This plate 41 is extended and bears on the inner end of the plug which closes the opening in the crank casing. When the plug is screwed in, the plate 41 is lifted from engagement with the contact 40 and this breaks the circuit through the solenoid. When, however, the plug is partially unscrewed, then the plate 41 will engage the contact 40 and a circuit will be established through the solenoid. The complete removal of the plug, however, again breaks the circuit as both plates 41 and 39 are insulated from the casing 36. When the solenoid is energized, the core will be raised and will lift the extension 13*a* and the arm 13 so as to release the lip 14 from the latch 29. As soon as this lip is released from the latch, the spring of the arm 12 will retract the

lip sufficiently so as to separate the arm 12 from its engagement with the contact 15. This will break the circuit and disconnect the lamp so that the signal is off. This movement of the arm 13, which releases the arm 12 from the contact 15, also places the lip in rear of the latch. The solenoid core will be operated only when the circuit is established and then the arm 13a is released so that the lip drops in rear of the latch. This is a re-setting of the control means for the next cycle of operation.

The control disk 19 turns through one rotation when the vehicle has traveled a predetermined distance by the odometer connection. When the signal is operated by the closing of the switch therefor, the control disk 19 stops until the oil has been drained from the crank casing and the plug re-inserted when the switch is released and the parts re-set so that when the vehicle travels again a similar distance, the signal will be operated. In other words, it makes no difference how long the operator neglects the warning of the signal and drains the oil, the next cycle of operation will occur at the same distance interval.

The shaft section at the right, as viewed in Figs. 5 and 6, is provided with annular grooves 42, 43 and 44. Attached to a projecting portion of the bracket 11, is a spring 45 having an arm which, as shown, engages the annular groove 42 and this will yieldingly hold the shaft sections from movement one on the other and maintain the gear 25 in mesh with the rack 26. On the end of the shaft 23 is a finger disk 46 which may be grasped for moving the shaft endwise. When the shaft is extended so as to bring the gear 25 into mesh with the rack 27, the spring drops into the annular groove 43. And when it is further extended so as to bring the gear 25 into mesh with the rack 28, then the spring drops into groove 44. The spring 45 has an upstanding portion 45a which when forced out of the recess, contacts with the disk 16 and prevents its being moved until the spring drops into a recess and releases that disk. This prevents accidental movements of the disk 16 when the gear wheel 25 is disengaged therefrom. While this finger piece 46 is readily reached by the operator, there is no means available for opening the switch to release the signal. This is controlled solely by the switch, which in turn is operated by the removal of the drain plug from the crank casing. The disk 16 is yieldingly moved by the spring 20 into engagement with the gear 25. It may be limited in its movement by an annular rib contact with the sleeve 17.

While the signaling device as shown and described, has a lamp which is lighted when the circuit is established, it will be understood that other forms of electrically controlled signaling devices may be used. While the releasing of the signaling device and the re-setting of the control means for the next cycle of operation, is accomplished by the removal of the plug through which the crank casing is drained, it will be understood the switch may be controlled in other ways, it being essential, however, that the draining of the oil shall render the switch operative for the releasing of the signal.

It is obvious that changes in the details of construction and the arrangement of the parts may be made without departing from the spirit of the invention as set forth in the appended claims.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

1. In combination with a motor vehicle including a crank case and draining means therefor, a signaling device for said motor vehicle comprising a casing, a vehicle actuated odometer mounted in said casing, an electrically operated signaling device associated with said odometer, a circuit connected to said signaling device, a switch in said circuit, a control disk for closing said switch, means for frictionally driving said control disk from the actuating mechanism of the odometer, a latch carried by said control disk, an arm carried by the switch having a lip adapted to be engaged by said latch whereby the control disk closes the switch when said control disk has been given a predetermined angular movement, said lip serving to restrain said control disk from further movement while the switch is closed and manually controlled means for releasing the switch.

2. In combination with a motor vehicle including a crank case and draining means therefor, a signaling device for said motor vehicle comprising a casing, a vehicle actuated odometer mounted in said casing, an electrically operated signaling device associated with said odometer, a circuit connected to said signaling device, a switch in said circuit, a control mechanism for closing said circuit including a shaft connected to and rotated by said odometer mechanism, said shaft including telescoping sections shiftable to different set positions, a gear carried by the shiftable section of said shaft, a disk mounted for rotation and having a plurality of annular racks adapted to selectively mesh with said gear whereby said disk may be driven at different speeds relative to the odometer mechanism, a control disk having frictional engagement with said first-named disk and rotated thereby, said switch having an arm provided with a lip, a latch carried by said control disk adapted to engage said lip and close said switch for operating said signaling device, said arm serving to restrain the movements of said control disk while said switch is closed and manually operated means for disengaging said lip from said latch for releasing the control disk and for the opening of said switch.

3. In combination with a motor vehicle including a crank case having an oil port and a closure member therefor, a signal for said motor vehicle comprising a casing, a vehicle actuated odometer mounted in said casing, an electrically operated signaling device associated with said odometer, a circuit connected to said signaling device, a switch in said circuit for controlling the signaling device, a control member operated by the odometer mechanism, said control member and said switch having cooperating means for closing the switch at predetermined distances of travel and for preventing further operation of said control member when the switch is closed and means operable upon the movement of said closure member for releasing said switch whereby to disconnect said signaling device and release said control member.

4. In combination with a motor vehicle including a crank case having an oil port and a closure member therefor, a signal for said motor vehicle comprising a casing, a vehicle actuated odometer mounted in said casing, an electrically operated signaling device associated with said odometer, a circuit connected to said signaling device, a switch in said circuit for controlling the signaling device, control means frictionally operated by the odometer mechanism, said control member and

said switch having cooperating means for closing the switch at predetermined distances of travel and for preventing further operation of said control member when the switch is closed and means operable by said closure member for releasing said switch whereby to disconnect said signaling device and permit said control means to move with the odometer mechanism through a similar cycle of operation.

5. In combination with a motor vehicle including a crank case having an oil port and a closure member therefor, a signal for said motor vehicle comprising a casing, a vehicle actuated odometer mounted in said casing, an electrically operated signaling device associated with said odometer including a disk connected to the actuating mechanism of said odometer and rotating in timed relation therewith, a control disk having frictional engagement with said first-named rotating disk, a latch carried by said control disk, a circuit for said signaling device, a switch for controlling said circuit, said switch including an arm having a lip adapted to be engaged by said latch for closing said switch and for restraining said control disk from further movement until the switch is opened, electrically operated mechanism for releasing said arm from said latch to permit the opening of said switch and the releasing of said control disk whereby it will then turn with the rotating disk of the odometer mechanism, and means for controlling said electrically operated mechanism upon the movement of said closure member.

6. In combination with a motor vehicle including a crank case having an oil port and a closure member therefor, a signal for said motor vehicle comprising a casing, a vehicle actuated odometer mounted in said casing, an electrically operated signaling device associated with said odometer including a disk connected to the actuating mechanism of said odometer and rotating in timed relation therewith, a control disk having frictional engagement with said first-named rotating disk, a latch carried by said control disk, a circuit for said signaling device, a switch for controlling said circuit, said switch including an arm having a lip adapted to be engaged by said latch for closing said switch and for restraining said control disk from further movement until the switch is opened, electrically operated mechanism for releasing said lip from said latch including a solenoid, a circuit having a switch therein for controlling said solenoid, and means operable upon the movement of said closure member for closing said last-named switch whereby said solenoid is energized for releasing said lip from said latch.

7. In combination with a motor vehicle including a crank case having an oil port and a closure member therefor, a signal for said motor vehicle comprising a casing, a vehicle actuated odometer mounted in said casing, an electrically operated signaling device associated with said odometer, a circuit connected to said signaling device, a switch in said circuit, a control disk for closing said switch, means for frictionally driving said control disk from the actuating mechanism of said odometer, a latch carried by said control disk, an arm carried by the switch having a lip adapted to be engaged by said latch for closing said switch when said control disk has been given a predetermined angular movement, said lip serving to restrain said control disk from further movement while said switch is closed, electrically controlled means for releasing said switch and said disk, and means for controlling said electrically controlled means upon the movement of said closure member.

8. In combination with a motor vehicle including a crank case having an oil port and a closure member therefor, a signal for said motor vehicle comprising a casing, a vehicle actuated odometer mounted in said casing, an electrically operated signaling device associated with said odometer, a circuit connected to said signaling device, a switch in said circuit, a control disk for closing said switch, means for frictionally driving said control disk from the actuating mechanism of said odometer, a latch carried by said control disk, an arm carried by the switch having a lip adapted to be engaged by said latch for closing said switch when said control disk has been given a predetermined angular movement, said lip serving to restrain said control disk from further movement while said switch is closed, an electromagnet for releasing said lip from contact with said latch and for opening the switch, a circuit for said electromagnet including a switch, and means for closing said switch upon the removal of said closure member.

9. In combination with a motor vehicle including a crank case having an oil port and a closure member therefor, a signal for said motor vehicle comprising a casing, a vehicle actuated odometer mounted in said casing, an electrically operated signaling device associated with said odometer, a circuit connected to said signaling device, a switch in said circuit, a control mechanism for closing said circuit including a shaft connected to and rotated by said odometer mechanism, said shaft including telescoping sections shiftable to different set positions, a gear carried by a shiftable section of said shaft, a rotatable disk having a plurality of annular racks adapted to selectively mesh with said gear whereby said disk may be driven at different speeds relative to the odometer mechanism, a control disk having frictional engagement with said first-named disk and rotated thereby, said switch having an arm provided with a lip, a latch carried by said control disk adapted to engage said lip and close said switch for operating said signaling device, said lip serving to restrain the movements of said control disk while said switch is closed, a solenoid, means connecting said arm with said solenoid for disengaging said lip from said latch when said solenoid is energized, a circuit for said solenoid, a switch for said circuit, and means operable upon the movement of said closure member for closing said switch.

RICHARD C. CALE.