

July 15, 1941.

R. H. HILL

2,249,137

AUTOMATIC RESET FOR DIRECTION SIGNALS

Filed Dec. 11, 1939

2 Sheets-Sheet 1

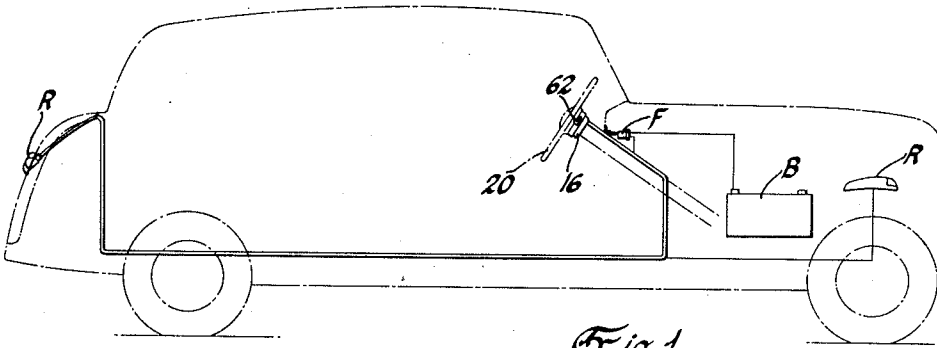


Fig. 1

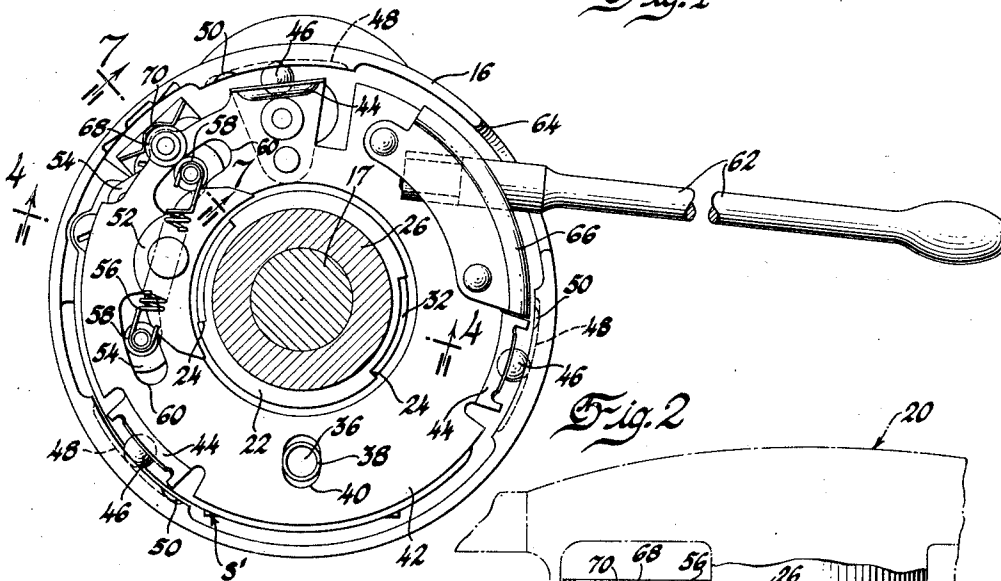


Fig. 2

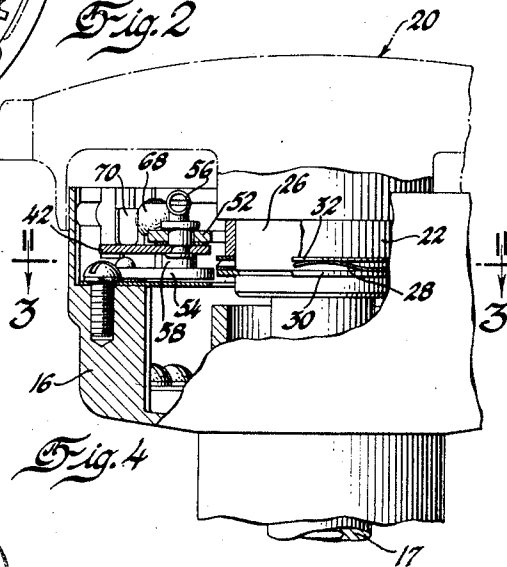


Fig. 4

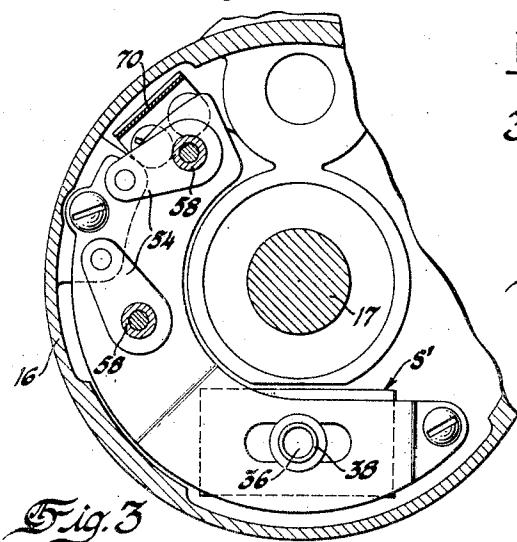


Fig. 3

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2 Sheets-Sheet 2

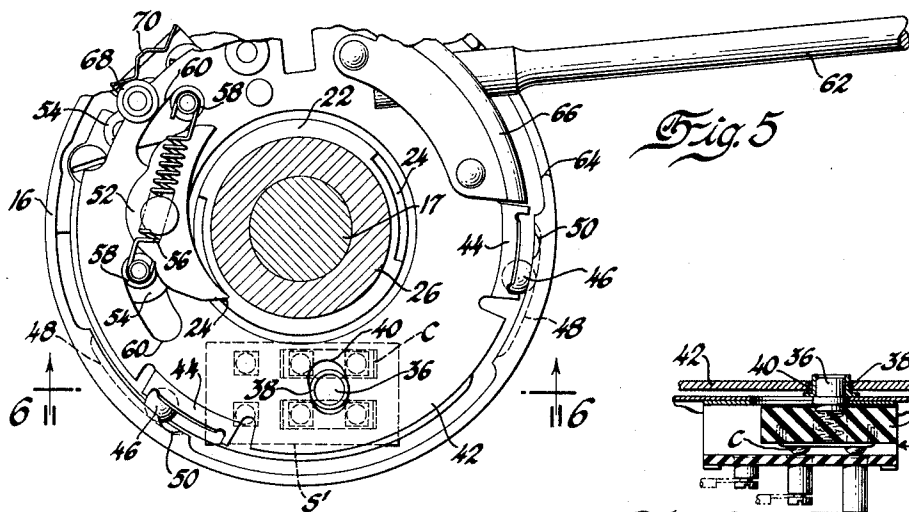


Fig. 5

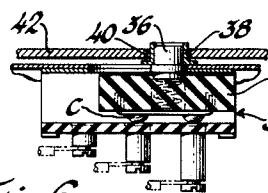


Fig. 6

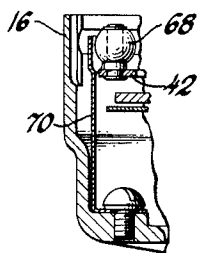


Fig. 7

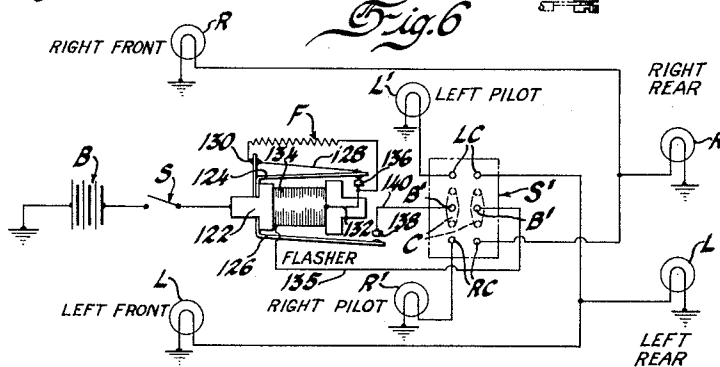


Fig. 8

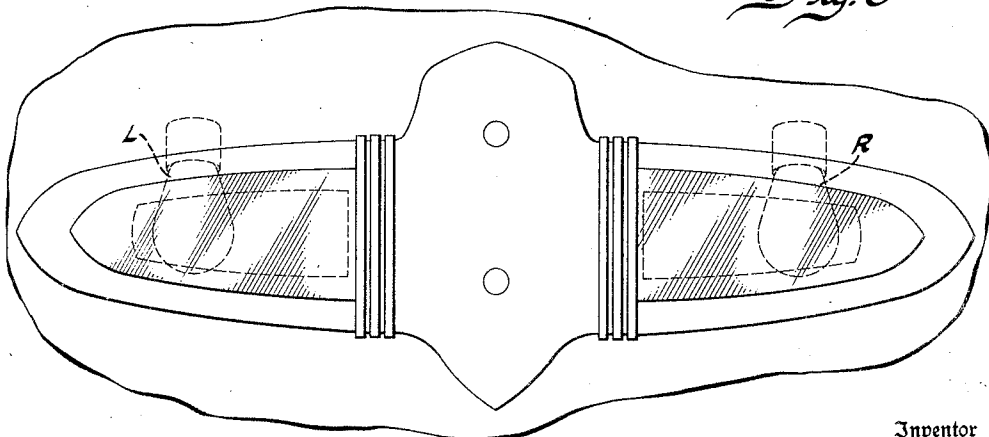


Fig. 9

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UNITED STATES PATENT OFFICE

2,249,137

AUTOMATIC RESET FOR DIRECTION SIGNALS

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Application December 11, 1939, Serial No. 308,547

7 Claims. (Cl. 200—59)

This invention has to do with operating means for direction signals and particularly with improvements on the operating means described and claimed in the copending application of Harry C. Doane and Albert G. Vosburg, Serial No. 308,033, filed December 7, 1939.

One improvement is in the means for applying spring bias to the resetting pawl carried by the manually operated annular member which operates the direction signal. The improved arrangement is such that all the parts are at all times under spring pressure so that the possibility of rattling is minimized.

Another improvement has to do with the manner of mounting on the steering shaft the notched sleeve which cooperates with the pawl to automatically reset the signal operating means. The new arrangement is very simple but effective.

Other improvements and their advantages will be pointed out in the course of the following description.

Figure 1 is a diagrammatic view showing the use of the direction signal operating means on a conventional automobile.

Figure 2 is a top plan view of the signal operating mechanism.

Figure 3 is a view taken on line 3—3 of Figure 4.

Figure 4 is a fragmentary sectional view taken on line 4—4 of Figure 2.

Figure 5 is a view similar to Figure 2 but with the parts in different position.

Figure 6 is a section taken on line 6—6 of Figure 5.

Figure 7 is a fragmentary section on line 7—7 of Figure 2.

Figure 8 shows diagrammatically the direction signal circuit.

Figure 9 is an elevation of the rear direction signals.

There is illustrated in Figure 8 a preferred form of direction signal circuit with which the present invention is employed. Current is supplied from battery B through the usual ignition switch S; then through the flasher F and switch S' either to the right front and right rear direction signals R and the right pilot lamp R' or to the left front and left rear direction signals L and the left pilot light L'. Switch S' comprises two simultaneously movable bridging contacts C shown in off position but adapted to be moved to one side or the other to engage either the right hand contacts RC or the left hand contacts LC and supply them with current from battery contacts B'. The flasher F supplies interrupted

current to the direction signals and to the pilot lamps.

Flasher F consists of a metal frame 122 carrying armatures 124 and 126. Armature 124 is normally held out of contact with frame 122 by means of resistance wire 128 anchored in insulator 130 and connected to insulated lead 132 in series with solenoid 134 the other end of which is connected by lead 135 to right hand contact B', shown in Figure 2, which supplies current to the direction signals. Lead 132 is connected to stationary contact 136 which is adapted to engage a contact carried by armature 124 as shown. Armature 126 carries a suitable contact adapted to engage stationary contact 138 connected by lead 140 to left hand contact B' which supplies current to the pilot lamps.

The circuit operates as follows: With ignition switch S closed and switch S' operated to cause movable contacts C to bridge fixed contacts B' and RC to indicate a right turn, current flows from the battery B through frame 122 to armature 124, resistance 128, insulated lead 132, solenoid 134, lead 135, fixed contact B', movable contact C, fixed contact RC to the right direction signals. However the resistance of wire 128 is so great that there is not sufficient flow of current to light the signals. The current that does flow is, however, sufficient to heat wire 128 and cause it to expand so that armature 124 engages contact 136, thereby shortcircuiting resistance 128 and permitting sufficient current to flow to cause the right direction signals to burn brightly. At the same time the increased flow of current causes solenoid 134 to attract armature 126, thereby permitting current to flow from the battery through frame 122, armature 126, fixed contact 138, lead 140, left hand contact B', movable switch contact C, fixed contact RC to the right pilot lamp R'. Short-circuited resistance 128 now cools off and contracts thereby breaking the contact of armature 124 with fixed contact 136 thereby restoring the circuit to its original condition in which both the signals and pilots are out. This cycle of operations is repeated as long as the signaling circuit is closed thereby flashing both signal lamps and the pilot lamp on the side selected.

One advantage of this circuit is the fact that should either or both of the direction signals on the side toward which a turn is being signaled, fail to operate, the corresponding pilot lamp R' or L' will not flash for the current flowing in the circuit will be insufficient to cause magnet 134 to attract its armature 126.

17 indicates the steering shaft to which the steering wheel 20 is secured. 22 indicates a sleeve having opposed notches 24 in its outer surface mounted to turn with the steering wheel. This is preferably accomplished by slipping the sleeve 22 over a reduced portion 26 of the hub of the steering wheel and holding it yielding in position by means of an undulating flat spring 28 held on the reduced portion 26 by snap ring 30 seated in a suitable groove in the position 26 as shown. The other end of the spring engages washer 32 bearing against the under side of sleeve 22. The effect of this arrangement is to cause the sleeve 22 to rotate with the steering wheel and shaft but should it encounter substantial resistance to movement the spring 28 permits it to slip and remain stationary while the wheel and shaft turn. The sleeve 22 restores the direction signal mechanism to off position in a manner later to be described.

Direction signal switch S', previously referred to, is best shown in Figures 3, 5 and 6. It preferably takes the form of a simple double-throw sliding switch. The movable contacts C are carried by a block of insulation 34 as best shown in Figure 6, the insulation being provided with a projecting stud 36 encircled by sleeve 38 and both extending through slot 40 in annular member 42 mounted for limited rotational movement in the enlarged upper end 16 of the steering shaft housing. In order to reduce friction to a minimum the plate 42 is preferably formed to provide keepers 44 for ball bearings 46 which ride in grooves 48 provided in the interior of the upper end of the enlarged housing portion 16. Suitable filling grooves, such as are shown at 50, may be provided to permit ready insertion of the balls.

52 indicates a double-ended pawl centrally pivoted on annular member 42. In the off position of the switch and its operating mechanism pawl 52 is held in the position shown in Figure 2 by means of levers 54, best shown in Figure 3 carrying rollers 58 engaging the pawl, the levers being connected at their free ends by coil spring 56. The ends of the spring preferably encircle the pivots of the rollers. It will be noted that rollers 58, as best shown in Figure 2, are guided in slots 60 which snugly fit the rollers at their far ends but at their adjacent ends are enlarged so as to permit them to engage the sides of the pawl 52, as shown in Figure 2, so as to exert pressure on it to hold it in central position out of engagement with notches 24 or ring 22.

62 indicates an operating handle secured in any suitable manner in the annular member 42 and projecting outwardly through arcuate slot 64 in enlarged housing portion 16. 66 indicates a guard or baffle secured to the annular member 42 and apertured to permit passage of lever 62 therethrough; the baffle covers the slot 64 to conceal the mechanism from view.

On the annular member 42 is mounted a roller 68 cooperating with spring pressed detent 70 bolted to the bottom of the enlarged portion 16 of the steering post housing as best shown in Figure 7. The detent 70 serves by its spring pressure to yieldingly hold the annular member 42 either in the off position shown in Figure 2 or in one of the on positions, one of which is shown in Figure 5.

The mechanism operates as follows: If it is desired to indicate a left turn, handle 62 and with it annular member 42 is moved in counterclockwise direction from the position shown in Figure 2 to the position shown in Figure 5 in

which it is held by engagement of spring detent 70 with roller 68. This moves bridging contacts C to the position shown in Figure 5 as a result of the pin and slot connection 40—36 between the annular member 42 and the movable element of the switch S'. At the same time rotation of the annular member 42 causes the lower end of pawl 52 to move under the roller 58 on the lower lever 54 as shown in Figure 2 while the constricted portion of the slot 60 engages the roller 58 holding it out of engagement with the upper end of pawl 52 as shown in Figure 5. This causes dog 52 to rotate slightly in counterclockwise direction until its lower end comes into contact with the periphery of sleeve 22. When the steering wheel 20 and shaft 17 are rotated in counterclockwise direction to make the left turn for which the signal has been given the sleeve 22 is also rotated and moves around beneath the engaging end of pawl 52 without interference, the end of the pawl 52 being permitted by the spring to move in and out in passing over the notches 24. When the turning movement has been completed and it is desired to straighten up the wheels for travel straight ahead the clockwise rotation of the steering wheel and shaft sooner or later causes the parts to assume the position shown in Figure 5 and any further clockwise rotation causes the pawl 52, ring 42 and movable switch contacts C to be carried around by the movement of the steering wheel until the pawl is rotated in clockwise direction by the action of levers 54 and spring 56 withdrawing its end from engagement with the notch 24. Toward the end this action is accelerated by the snap action given to ring 42 by detent 70 as roller 68 enters the central depression of the detent. This snap action makes it possible for the pawl 52 to momentarily get a little ahead of the ring 22 so that the end of the pawl can clear the end of the notch. The parts are now in the position shown in Figure 2 with the switch S' in off position.

As the mechanism operates in substantially the same way when making a right turn no further description of the operation will be given.

It will be apparent that once the handle 62 has been moved to indicate a turn the indication remains throughout the turning movement and until the straightening up of the wheels has proceeded to a sufficient extent so that a notch 24 engages an end of the pawl 52 and restores the operating mechanism to off position. At the same time should it be desired to turn off the direction signal without straightening the wheels this may readily be done by simply moving the lever 62 to off position. The friction drive for the resetting sleeve 22 which is provided by the undulating spring 28 makes it possible for the driver to always be able to steer the vehicle even though something should happen to the signal operating mechanism causing it to jam. This is essential for safe operation.

Attention is called to the fact that the spring-pressed roller-carrying levers 54 apply spring pressure to pawl 52 at all times thereby holding it from rattling. Detent 70 yieldingly holds the annular member 42 in either on or off position supplementing the spring detent action of switch S' and at the same time gives the desired snap action permitting pawl 52 to readily withdraw from engagement with the notches in ring 22 as previously described.

The friction drive for sleeve 22 is simple, reliable and of low cost.

I claim:

1. In operating mechanism for direction signals for vehicles the combination of a steering shaft having a shoulder thereon, means shiftable about the axis of the shaft for operating said signal, and means for resetting said operating means comprising a sleeve surrounding the shaft and abutting the shoulder at one end, means carried by the shaft yieldingly pressing the sleeve against the shoulder so as to cause it to rotate with the shaft, and means connected to said operating means and adapted to operatively engage the sleeve when the shaft is returned toward straightaway position to return said operating means to off position.

2. In operating mechanism for direction signals for vehicles the combination of a steering shaft having a shoulder thereon, means shiftable about the axis of the shaft for operating said signal, and means for resetting said operating means comprising a sleeve surrounding the shaft and abutting the shoulder at one end, means carried by the shaft yieldingly pressing the sleeve against the shoulder so as to cause it to rotate with the shaft comprising an annular undulating spring surrounding the shaft and in engagement with the other end of the sleeve and means on the shaft against which the spring reacts, and means connected to said operating means and adapted to operatively engage the sleeve when the shaft is returned toward straightaway position to return said operating means to off position.

3. In operating mechanism for direction signals for vehicles the combination of a steering shaft having a shoulder thereon and an annular groove therein adjacent said shoulder, means shiftable about the axis of the shaft for operating said signal, and means for resetting said operating means comprising a sleeve surrounding the shaft and abutting against the shoulder at one end, a spring surrounding the shaft and urging the sleeve against the shoulder, and a snap ring in said groove against which the spring reacts, and means connected to said operating means and adapted to operatively engage the sleeve when the shaft is returned toward straightaway position to return said operating means to off position.

4. In operating mechanism for direction signals for vehicles the combination of a steering shaft, an annular member mounted for rotary adjustment about the axis of said shaft, means for actuating direction signals operated by rotation of said annular member, a pawl centrally pivoted to said annular member, means on said shaft constructed and arranged to be engaged with an end of said pawl, means yieldingly holding said pawl out of engagement with said last-named means in the off position of said annular member, and means actuated by movement of said annu-

lar member to signal actuating position to rock said pawl into operative engagement with the means on said shaft so that upon reverse rotation of the shaft the annular member is rotated to off position, said yielding means comprising pivoted levers having their free ends engaged with said pawl on opposite sides of its pivot, and means for yieldingly urging the free ends of said levers toward each other.

5. In operating mechanism for direction signals for vehicles the combination of a steering shaft, means shiftable about the axis of the shaft for operating the signal, and means for resetting said shiftable means comprising a pawl pivoted to the shiftable means and adapted to have operative engagement with the shaft when tilted, means for holding said pawl out of engagement with the shaft comprising pivoted levers having their free ends in engagement with said pawl at opposite sides of its pivot, and means yieldingly urging said levers into engagement with said pawl.

6. In operating mechanism for direction signals for vehicles the combination of a steering shaft, means shiftable about the axis of the shaft for operating the signal, and means for resetting said shiftable means comprising a pawl pivoted to the shiftable means and adapted to have operative engagement with the shaft when tilted, means for holding said pawl out of engagement with the shaft comprising pivoted levers having their free ends in engagement with said pawl at opposite sides of its pivot, and means yieldingly urging said levers into engagement with said pawl, cam means carried by said shiftable means and adapted on rotation of said shiftable means in either direction to move one of said levers out of engagement with said pawl and one of said levers into engagement therewith to rock the pawl into operative engagement with the shaft.

7. In operating mechanism for direction signals for vehicles the combination of a steering shaft, means shiftable about the axis of the shaft in either direction from mid position for operating the signals, a pawl centrally pivoted to said shiftable means, means brought into action by shifting of said shiftable means for tilting said pawl to cause one or the other end to operatively engage said shaft, said shaft having means thereon adapted to be engaged by the tilted pawl upon return of said shaft toward straightaway position to restore said shiftable means to off position, and means for yieldingly holding the shiftable means in off position or in either of said on positions including a cam adapted to accelerate the return movement of said shiftable means toward the end of the return movement to facilitate disengagement of the pawl and shaft.

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