Nov. 29, 1955 C. J. CISLO 2,725,435

TURN SIGNAL DEVICE

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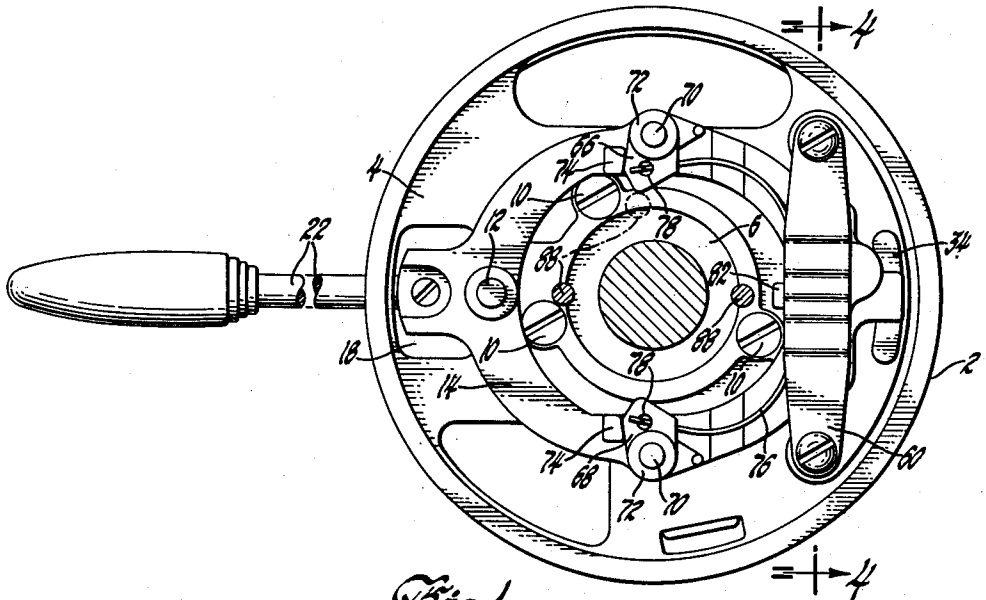


Fig. 1

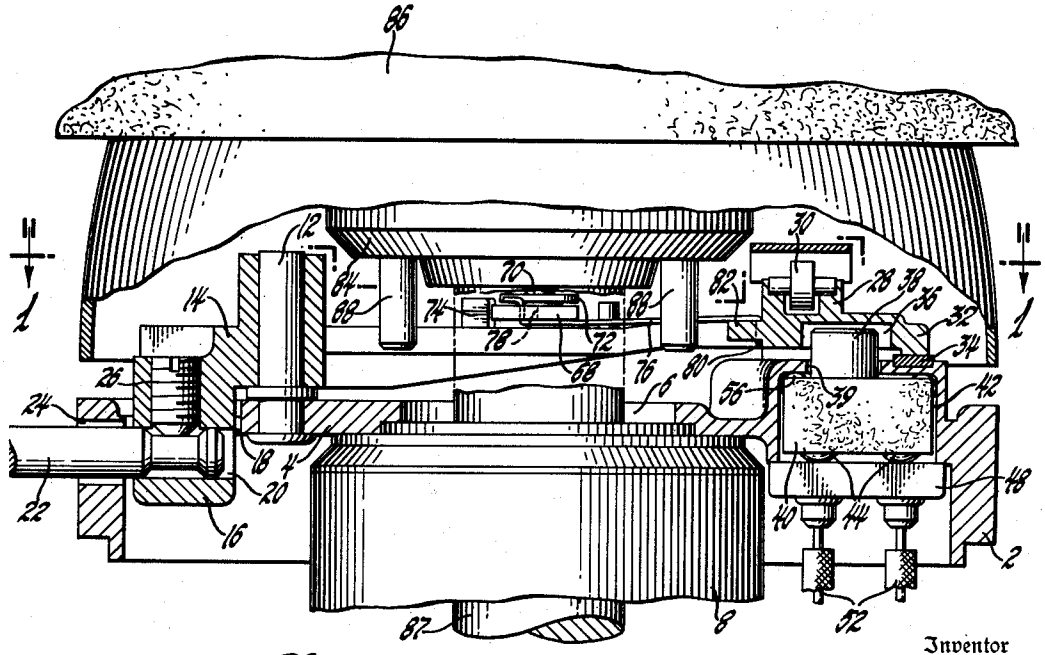


Fig. 2

Inventor
Casimer J. Cislo

By Willitt, Helwig & Baillio
Attorneys

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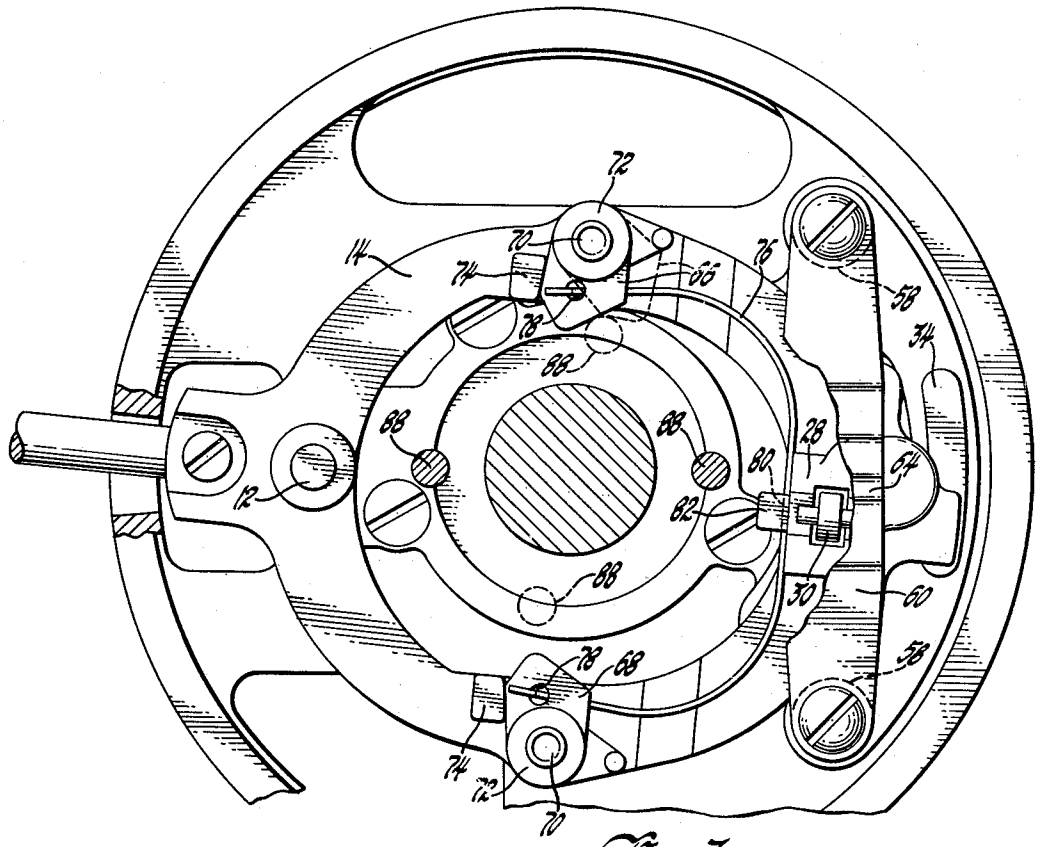


Fig. 3

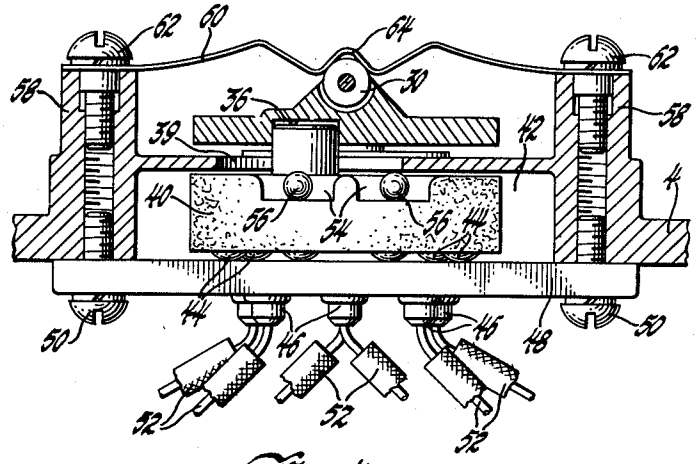


Fig. 4

Inventor
Casimer J. Cislo

By Willits, Helwig & Baillio
Attorneys

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TURN SIGNAL DEVICE

Casimer J. Cislo, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

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12 Claims. (Cl. 200—61.34)

The present invention relates to vehicle direction signaling systems and more particularly to devices for controlling such systems.

An object of the invention is to provide a direction signaling device of the manually set and automatically reset type which is compact, inexpensive and especially adapted to mass production.

Another object of the invention is to provide a support for the mechanism of direction signaling devices in which the switch housing is formed integral with the support.

These and other objects are attained in accordance with the present invention by providing a direction signal device so constructed and arranged as to require relatively few operative parts.

For a better understanding of the invention, reference may be had to the drawings in which Fig. 1 is a view taken along the line 1—1 of Fig. 2, except in smaller scale; Fig. 2 is an elevational view of the present invention with parts broken away and parts in section; Fig. 3 is an enlarged view similar to Fig. 1 illustrating the device of the invention in one operative position, and Fig. 4 is a fragmentary view taken along the line 4—4 of Fig. 1.

Referring to the drawings and particularly Figs. 1 and 2, there is illustrated the direction signaling device of the present invention comprising a housing 2 which is substantially cylindrical in shape with a web 4 having an aperture 6 at substantially the center. The web portion is adapted to be received on the reduced end of the steering column 8 of an automotive vehicle and is secured to the steering column by threaded members 10 which pass through the web and threadedly engage the steering column.

Pivotally mounted within the housing on the upwardly extending pin 12 secured on the web 4 is a die cast ring 14 which is substantially concentric to the steering column on which the housing is mounted. The ring assembly is provided with a downwardly extending lug 16 adjacent the pin 12 which passes through an aperture 18 in the web 4 and is formed with a radially extending bore 20 adapted to receive a lever arm 22 which extends outwardly through an elongated aperture 24 in the generally cylindrical wall of the housing. The lever arm 22 is secured to the ring assembly by a threaded member 26. Substantially opposite the lever arm, the ring 14 is provided with a raised portion 28 which is adapted to journal a roller 30. A lug 32 extends outwardly from the ring 14 adjacent the raised portion 28 and is adapted to engage a pad 34 of suitable friction material which is recessed in the web portion 4 of the housing 2. With such an engagement of lug 32 and pad 34 vibration of the ring 14 is substantially reduced. A recess 36 in the underside of the ring 14 and adjacent the foot 32 is adapted to receive the switch arm 33 which passes through an elongated aperture 39 in the web 4 and is integral with the switch block 40 slidably mounted in a recess 42 formed integrally with the web 4.

The switch block 40 carries a plurality of bridging contacts 44 which are adapted to engage a plurality of terminals 46 in a terminal plate 48 attached to the housing 2 by threaded members 50 as shown in Figure 4. In this connection it will be seen that the terminal plate 46 also serves to enclose the switch block 40 in the recess 42. The terminals 46 are connected to lead wires 52 in the circuits of a direction signal system to provide suitable circuit connections for the signaling system. To reduce frictional resistance in moving the switch block 40 to its various operative positions the switch block is provided with recesses 54 which are adapted to receive ball bearings 56. The ball bearings 56 engage the corners of the recess 42 and guide the movement of the switch block 40 in the housing to prevent engagement of the switch block with the walls of the recess 42 as shown in Figure 4.

A pair of lugs 58 extending upwardly from the web 4 are adapted to mount a resilient detent plate 60. The detent plate spans the lugs 58 and is secured thereto by threaded members 62. This detent plate is formed with an undulating mid-portion 64 which defines a notch in which the roller 30 is engaged to index and hold the ring 14 in its neutral position. On each side of the notch are ramp portions which engage the roller 30 and yieldingly urge the ring to either of its two operative positions after the roller has been moved out of the notch.

Oppositely disposed on the upper side of the ring 14 are pawls 66 and 68 which are pivotally mounted on pins 70 extending upwardly from the ring 14 and integral therewith. The pawls 66 and 68 are secured in position on the ring 14 by washers 72 which are secured by peening over the ends of pins 70. Raised portions 74 on the upper side of the ring 14 form abutments for the pawls 66 and 68. The pawls are yieldingly urged into engagement with the abutments 74 by a C-shaped spring 76, the ends of which are formed to pass through and engage the pawls through apertures 78 as shown. At substantially its center the spring 76 is provided with a U-shaped portion 80 which is slidably received on an inwardly extending lug 82 integral with the ring 14 and is seated against the raised portion 28.

To provide for the automatic resetting of the direction signaling device the housing and ring assembly are mounted on the steering column adjacent the hub portion 84 of the steering wheel 86 which is attached to the steering shaft 87. Depending downwardly from the hub portion 84 are a pair of pins 88 which extend into and rotate within the ring assembly. In this connection, it will be understood that a single pin would be suitable depending on the angular rotation of steering wheel 86 desired for resetting of the mechanism.

In operation, the lever arm 22 and ring 14 may be rotated in a clockwise direction about the pin 12 to position pawl 66 in the path of the pins 88 extending downwardly from the hub of the steering wheel. Such a clockwise rotation of the arm 22 and ring 14 causes movement of the switch block 40 in housing 39 to one of its operative positions in which the contacts 44 engage terminals 46 to provide a circuit relationship adapted to give a predetermined signal indicating one direction of turn for the vehicle. Likewise, such a clockwise rotation of the lever arm 22 and ring 14 causes the roller 30 to be moved out of its neutral positioning notch to engage an adjacent ramp portion which yieldingly urges the lever and ring assembly to one of its operative positions as will be clear by referring to Figure 4. With a clockwise rotation of the steering wheel 86, one or both of the downwardly extending pins 88 engage the pawl 66 and with continued rotation rotate the pawl against the pressure of spring 76 in a counterclockwise direction about its pivot pin 70 out of the path of pins 88. Upon reversal of the direction of rotation of the steering wheel 86 and the pins 88 to a counterclockwise direction one of the pins engages the pawl 66 which resists clockwise movement about pin

70 because of abutment with stop 74 thus causing ring 14 and lever 22 to rotate in a counterclockwise direction about pin 12 until the pawl 66 has been moved from the path of the pins 88. With movement of the lever and ring assembly toward the neutral position the roller 30 rides the ramp portion adjacent the neutral position notch causing the detent plate to deflect until the roller passes the trough of the undulated portion 64 whereupon the detent plate yieldingly urges the roller into the neutral position notch. As the ring and lever assembly returns to the neutral position the force of the detent plate causes some oscillation of the assembly. These oscillations are diminished by the frictional engagement of the lug 32 and pad 34.

It will be clear that with a movement of the lever arm and ring assembly in a counterclockwise direction about pin 12, the pawl 68 is moved into the path of the pins 88 and the switch block 40 is moved in an opposite direction to provide a circuit relationship adapted to give a signal indicating another direction of turn for the vehicle. Such circuits are well-known in the art and are not considered to require further description as they form no part of the present invention. With the pawl 68 moved into the path of pins 88 the operation of the lever and ring assembly for return to a neutral position will be the same as described hereinabove in connection with the rotation in a clockwise direction except that the operation of all parts will be in an opposite sense.

A device such as I have hereinabove described is simple in that it utilizes a one-piece die cast housing providing an enclosure for a movable switch block and comprises a minimum of operative parts thereby making it easy to manufacture, compact and inexpensive.

While the embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What I claim and desire to secure by Letters Patent of the United States is:

1. In a direction signaling device for automotive vehicles, a support, an operating member pivotally mounted on said support at one side thereof, a friction member recessed in said support adjacent said operating member, means attached to said operating member and extending therefrom into frictional engagement with said friction member to dampen oscillatory movements of said operating member, and a switch mounted on said support with its operating arm in engagement with said operating member.

2. In a direction signaling device for automotive vehicles, a housing having a substantially cylindrical wall and a web extending across said housing, said web being formed with a recess and an elongated slot, an operating member pivotally mounted in said housing, a switch block slidably mounted in said recess, said switch block having an arm extending through said slot in said web and into engagement with said operating member and a terminal plate mounted on said web in sliding engagement with said switch block.

3. In a direction signaling device for an automotive vehicle, a housing adapted for attachment to the steering column of said vehicle, said housing having a web portion formed with a recess therein, a switch block slidably mounted in said recess, a terminal plate attached to said web to enclose said switch block in said recess, an operating member pivotally mounted in said housing and in engagement with said switch block, a friction pad mounted in said web, means on said operating member in frictional engagement with said friction member to dampen oscillatory movements of said operating member, and detent means attached to said housing for engaging and indexing said operating member in one of a plurality of positions.

4. In an automotive vehicle having a steering column and a steering wheel with spaced projections movable with the latter, the combination of a housing, means for attaching said housing to said steering column adjacent said steering wheel, a direction signal switch mounted in said housing, an operating ring disposed in substantially concentric relation with said steering column for actuating said switch, means for pivotally mounting one end of said ring on said housing, said ring being movable from a center position to positions on either side of said center position, means operatively connecting said switch to said ring whereby the latter is closed upon movement of said ring to said positions on either side of said center position, and a pair of pawls pivotally mounted on said ring and disposed at opposite sides of the pivot thereof, one of said pawls lying in the path of said projections when said ring is moved in one direction from said center position and adapted to be engaged by said projections to move said ring to said center position when said steering wheel is rotated in one direction, and the other of said pawls lying in the path of said projections when said ring is moved in the other direction from said center position and adapted to be engaged by said projections to actuate said ring to said center position when said steering wheel is rotated in the opposite direction.

5. In an automotive vehicle having a steering column and a steering wheel with spaced projections movable with the latter, the combination of a housing, means for attaching said housing to said steering column adjacent said steering wheel, a direction signal switch mounted in said housing, an operating ring disposed in substantially concentric relation with said steering column for actuating said switch, means for pivotally mounting one end of said ring on said housing, said ring being movable from a center position to positions on either side of said center position, means operatively connecting said switch to said ring whereby the latter is closed upon movement of said ring to said positions on either side of said center position, a pair of pawls pivotally mounted on said ring and disposed at opposite sides of the pivot thereof, one of said pawls lying in the path of said projections when said ring is moved in one direction from said center position and adapted to be engaged by said projections to move said ring to said center position when said steering wheel is rotated in one direction, and the other of said pawls lying in the path of said projections when said ring is moved in the other direction from said center position and adapted to be engaged by said projections to actuate said ring to said center position when said steering wheel is rotated in the opposite direction, and a spring for yieldingly urging said pawls into the space beyond the inner periphery of said ring.

6. In an automotive vehicle having a steering column and a steering wheel with spaced projections movable with the latter, the combination of a housing, means for attaching said housing to said steering column adjacent said steering wheel, a direction signal switch mounted in said housing, an operating ring disposed in substantially concentric relation with said steering column for actuating said switch, means for pivotally mounting one end of said ring on said housing, said ring being movable from a center position to positions on either side of said center position, means operatively connecting said switch to said ring whereby the latter is closed upon movement of said ring to said positions on either side of said center position, a pair of pawls pivotally mounted on said ring and disposed at opposite sides of the pivot thereof, one of said pawls lying in the path of said projections when said ring is moved in one direction from said center position and adapted to be engaged by said projections to move said ring to said center position when said steering wheel is rotated in one direction, and the other of said pawls lying in the path of said projections when said ring is moved in the other direction from said center position and adapted to be engaged by said projections to actuate said ring to said center position when said steering wheel is rotated in the opposite direction, and operating means

for said ring, said operating means being connected to said ring adjacent the pivotal mounting thereof.

7. In an automotive vehicle having a steering column and a steering wheel with spaced projections movable with the latter, the combination of a housing, means for attaching said housing to said steering column adjacent said steering wheel, a direction signal switch mounted in said housing, an operating ring disposed in substantially concentric relation with said steering column for actuating said switch, means for pivotally mounting one end of said ring on said housing, said ring being movable from a center position to positions on either side of said center position, means operatively connecting said switch to said ring whereby the latter is closed upon movement of said ring to said positions on either side of said center position, a pair of pawls pivotally mounted on said ring and disposed at opposite sides of the pivot thereof, one of said pawls lying in the path of said projections when said ring is moved in one direction from said center position and adapted to be engaged by said projections to move said ring to said center position when said steering wheel is rotated in one direction, and the other of said pawls lying in the path of said projections when said ring is moved in the other direction from said center position and adapted to be engaged by said projections to actuate said ring to said center position when said steering wheel is rotated in the opposite direction, means for yieldingly retaining said ring and said switch in their different positions of adjustment, said last mentioned means comprising a roller journalled on said ring, and a resilient detent plate formed with a plurality of recesses adapted to successively receive said roller.

8. In an automotive vehicle having a steering column and a steering wheel with spaced projections movable with the latter, the combination of a housing, means for attaching said housing to said steering column adjacent said steering wheel, a direction signal switch mounted in said housing, an operating ring disposed in substantially concentric relation with said steering column for actuating said switch, means for pivotally mounting one end of said ring on said housing, said ring being movable from a center position to positions on either side of said center position, means operatively connecting said switch to said ring whereby the latter is closed upon movement of said ring to said positions on either side of said center position, a pair of pawls pivotally mounted on said ring and disposed at opposite sides of the pivot thereof, one of said pawls lying in the path of said projections when said ring is moved in one direction from said center position and adapted to be engaged by said projections to move said ring to said center position when said steering wheel is rotated in one direction, and the other of said pawls lying in the path of said projections when said ring is moved in the other direction from said center position and adapted to be engaged by said projections to actuate said ring to said center position when said steering wheel is rotated in the opposite direction, a friction member mounted in said housing adjacent said ring, and means on said ring frictionally engaging said friction member to dampen oscillatory movements of said ring and switch toward said center position.

9. In an automotive vehicle having a steering column and a steering wheel with spaced projections movable with the latter, the combination of a housing, means for attaching said housing to said steering column adjacent said steering wheel, a direction signal switch mounted in said housing, an operating ring disposed in substantially concentric relation with said steering column for actuating said switch, means for pivotally mounting one end of said ring on said housing, said ring being movable from a center position to positions on either side of said center position, means operatively connecting said switch to said ring whereby the latter is closed upon movement of said ring to said positions on either side of said center position, a pair of pawls pivotally mounted on said ring and disposed at opposite sides of the pivot thereof, and stop means on said ring for preventing pivotal movement of said pawls in one direction, one of said pawls lying in the path of said projections when said ring is moved in one direction from said center position and adapted to be rotated about its pivot by said projections when said steering wheel is turned in one direction and to be urged against said stop means to move said ring to said center position when said steering wheel is rotated in the reverse direction, the other of said pawls lying in the path of said projections when said ring is moved in the other direction from said center position and adapted to be roted about its pivot by said projections when said steering wheel is turned in one direction and to be urged against said stop means to actuate said ring to said center position when said steering wheel is rotated in the opposite direction.

10. In an automotive vehicle having a steering column and a steering wheel with spaced projections movable with the latter, the combination of a housing, means for attaching said housing to said steering column adjacent said steering wheel, a direction signal switch mounted in said housing, an operating ring disposed in substantially concentric relation with said steering column for actuating said switch, means for pivotally mounting one end of said ring on said housing, said ring being movable from a center position to positions on either side of said center position, means operatively connecting said switch to said ring whereby the latter is closed upon movement of said ring to said positions on either side of said center position, a pair of pawls pivotally mounted on said ring and disposed at opposite sides of the pivot thereof, stop means on said ring for preventing pivotal movement of said pawls in one direction, one of said pawls lying in the path of said projections when said ring is moved in one direction from said center position and adapted to be rotated about its pivot by said projections when said steering wheel is turned in one direction and to be urged against said stop means to move said ring to said center position when said steering wheel is rotated in the reverse direction, the other of said pawls lying in the path of said projections when said ring is moved in the other direction from said center position and adapted to be rotated about its pivot by said projections when said steering wheel is turned in one direction and to be urged against said stop means to actuate said ring to said center position when said steering wheel is rotated in the opposite direction, and a spring for yieldingly urging said pawls against said stop means.

11. A direction signal device comprising a support, a ring pivotally mounted on said support at one side thereof and movable from a central position to positions at opposite sides of said central position, oppositely disposed pawls pivotally secured on said ring, a spring yieldingly urging said pawls interiorly of said ring, detent means for said ring mounted in said housing opposite said pivotal mounting of said ring, rotatable cam means disposed centrally of said ring and adapted to engage one of said pawls when said ring is moved in one direction and to engage the other of said pawls when said ring is moved in the other direction, and an electric switch operatively engaging said ring for movement therewith.

12. In combination with an automotive vehicle having a steering mechanism, a direction signaling device comprising a support, an operating ring pivotally mounted on said support substantially concentric with said steering mechanism, oppositely disposed pawls pivotally mounted on said ring and extending inwardly thereof, said pawls being adapted for yielding uni-directional movement, rotatable means associated with said steering mechanism, said ring and pawls being movable to place either of said pawls in the path of said rotatable means for actuation thereby.

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