June 7, 1955 S. H. LAPIDUS 2,710,318

SIGNAL CONTROL DEVICES

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Fig. 1.

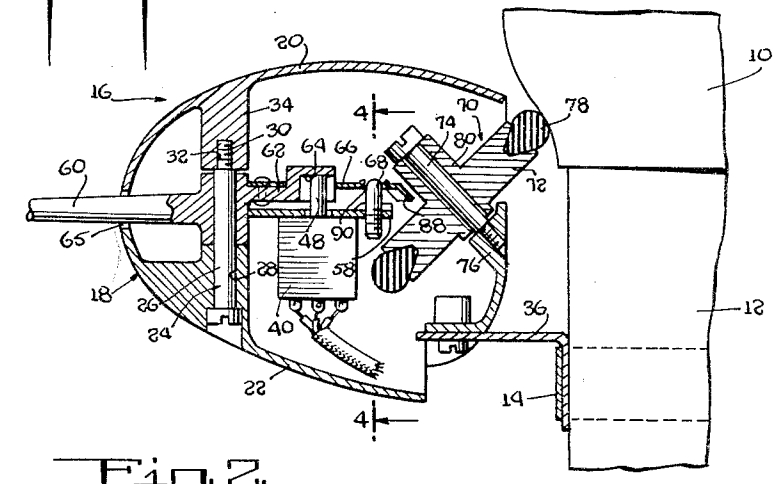


Fig. 2.

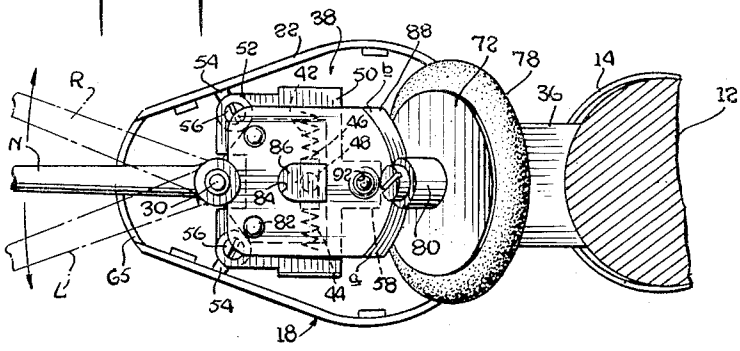


Fig. 3.

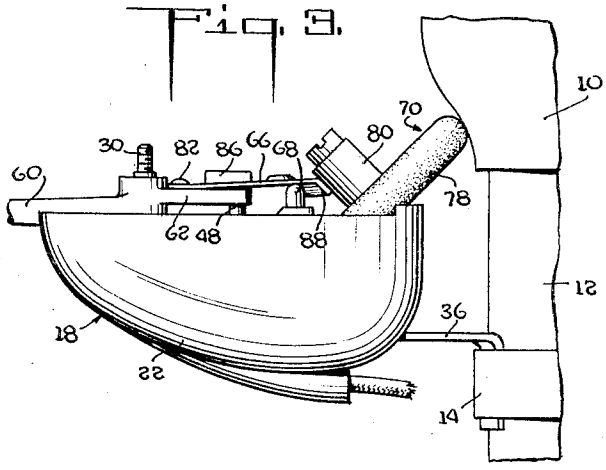
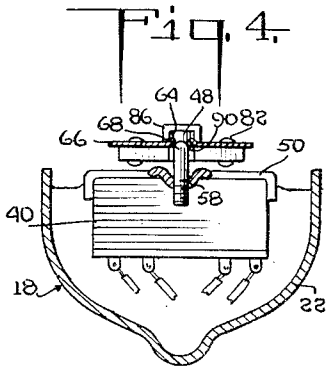


Fig. 4.



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SIGNAL CONTROL DEVICES

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Application May 5, 1953, Serial No. 353,211

8 Claims. (Cl. 200—61.37)

This invention relates to signal control devices.

More particularly my invention pertains to a device of the character described which is particularly designed to be attached to an automobile as an accessory for the control of signalling lights.

Even more specifically, my invention is concerned with a device of the character described which is self-cancelling; that is to say, which, after being set manually to indicate a given direction of turn, will be reset automatically upon the completion of such a turn.

Until the present time, all of these devices, either such as have been marketed or patented, have consisted of many parts and, hence, were relatively expensive to manufacture and tended to break down in use.

It is the principal object of my invention to provide a control device of the character described which comprises a minimum of parts, all of which are very simple, whereby the device can be manufactured at a low cost and will be particularly rugged.

Other objects of my invention will in part be obvious and in part will be pointed out hereinafter.

My invention accordingly consists in the features of construction, combinations of elements and arrangements of parts, which will be exemplified in the device hereinafter described and of which the scope of application will be indicated in the appended claims.

In the accompanying drawings in which is shown one of the various possible embodiments of my invention,

Fig. 1 is a vertical sectional view through a control device embodying my invention, the same being shown in neutral position and secured to the steering column of an automobile;

Fig. 2 is a top view of the control device with its cover removed;

Fig. 3 is a side view of the device with its cover removed, the same being shown as it appears when in position to signal a left-hand turn; and

Fig. 4 is a sectional view taken substantially along the line 4—4 of Fig. 1.

Referring now in detail to the drawings, the reference numeral 10 denotes the hub of a conventional steering wheel at the upper end of a steering column which is enclosed in a stationary steering post 12.

Detachably attached to the steering post in any suitable fashion, as for instance by a clamping ring 14, is a signal control device 16 embodying my invention. Said device includes a housing 18 which for convenience constitutes an upper half 20 and a lower half 22 conventionally interfitted. The two halves of the housing are held together suitably, as by a screw 24. The unthreaded shank 26 of the screw extends through a passageway 28 in the lower housing half and the threaded tip 30 of the screw engages a tapped bore 32 in a boss 34 extending integrally from the upper housing half 20. The tip of the screw is of lesser diameter than the shank so as to form a shoulder for limiting insertion of the screw into the boss.

The housing is fastened to the clamping ring 14 in some

suitable manner as for instance by an angle bracket 36.

Enclosed within the housing is a signal control mechanism 38 including a switch 40 of standard double throw construction. Said switch is of the single pole type; although it will be understood that any suitable form of switch can be used depending upon the character of the signalling circuit employed. Customarily a single line circuit is used for automobile vehicles, the chassis of an automobile constituting a ground. In such a case there will be one line running to the right-hand signals and one line to the left-hand signals. Each of these lines is in series with a battery (not shown) and the switch 40 so that either set of signals can be energized selectively. Usually the switch also includes contacts which will furnish an indication to the driver as by a pilot light that a signal is energized.

In addition to its conventional stationary and movable electric contacts, the switch includes suitable biasing means, as for example a pair of opposed compression springs 42, 44, which bias the movable contact to a central neutral position where it is disengaged from both of the stationary contacts. The movable contact is carried by a reciprocable block 46 from which a pin 48 projects upwardly so that moving the pin to one side or the other of its neutral position indicated in Fig. 2 causes the movable contact to engage one or the other of the stationary contacts, as the case may be, and thereby close the left-hand or right-hand signalling circuit. Due to the biasing springs 42, 44, the switch is of the momentary type; that is to say, unless the pin 48 is detained in either operative position the switch automatically is restored to neutral position.

Mounted on the switch as by constituting the top plate thereof or by being secured, for instance by welding, to the top plate of the switch is a plate 50 having a pair of ears 52. Said ears are seated on abutments 54 formed integrally with the lower casing half 22 and are secured thereto, as with screws 56. The plate 50 also includes a forwardly extending tongue 58.

The switch is arranged to be manually operated by a lever 60 pivoted on the portion of the screw 24 left clear between the two housing halves. The long outer end of said lever functions as a handle. The short inner end 62 of said lever has a radially extending recess 64 formed in its underside to slidably receive the pin 48. Thus, when the lever is rocked about the screw 24 is will reciprocate the pin 48 transversely. The lever swings in a slot 65 in the lower casing half, the extreme position of the lever being defined by abutment with the ends of the slot.

The switch contacts are so arranged that when the handle end of the lever is swung to the lower extreme the position L indicated by dotted lines in Fig. 2 the movable contact will engage the stationary contacts for energizing the left directional signalling devices. In its upper extreme position R the lever energizes the right directional signalling devices. The central or neutral position of the lever is indicated by the reference character N.

Pursuant to the present invention a highly novel means is included to releasably detain the lever in either one of its extreme operative positions R and L, and to cancel the detaining means when a turn corresponding to an indicated turn has been or is in the process of being completed.

Said means comprises three elements, to wit: a leaf spring 66, an elevating device such as a pin 68, and a friction wheel 70.

The friction wheel constitutes a dics 72 journalled on a screw 74 that is secured to an angular platform 76 formed integrally with the lower half 22 of the casing. The periphery of the disc is grooved to receive a ring 78

formed of a material having a good traction surface, as for example rubber. The ring is in permanent frictional engagement with the hub 10 of the steering wheel and the disc is so oriented that the ring is tangent to the hub as is well known in the art. The disc is formed with an upstanding centrally located stub shaft 80. The axis of rotation of the disc 72 and the axis of oscillation of the handle 60 are in a common plane which includes the longitudinal axis of the hub.

The leaf spring 66 is fashioned from a flat resilient material such for instance as a strip of Phosphor bronze. Said spring is comparatively short and relatively wide. The spring overlies and is carried by the inner end 62 of the lever 60. Said spring is secured to the lever adjacent the screw 24 so that the outer edge of the spring (the edge remote from the screw 24) can be flexed. The spring is fashioned with a through aperture 84 to freely pass the protuberance 86 over the recess 64.

The location of the outer edge 88 of the spring is highly critical. This edge must be disposed a short distance below the shaft 80 so that it can be raised into frictional engagement with the shaft. This relationship may be expressed somewhat differently, to wit: the remote edge of the spring must be close to the shaft 80 and the spring must be mounted for such movement relative to the shaft that said edge as it turns about the screw 24 will move toward or away from the shaft. To increase frictional engagement between the spring and shaft said edge 88 preferably slopes downwardly in approximate parallelism with the axis of rotation of the disc 72. The edge 88 is of arcuate contour and when viewed in plan is substantially circular (see Fig. 2) with its center at the screw 24. However, the ends *a*, *b* of said edge are slightly closer to the screw 24 than the middle of the edge for a reason which will be pointed out later.

The spring includes a depression 90 in its undersurface which is located directly about the elevating pin 68 when the lever 60 is in a neutral position, shown in full lines in Fig. 2. Optionally, the center of the depression can be eliminated to form an aperture 92. It will be appreciated that when the pin is located in the depression the spring lies flat against the inner end 62 of the lever 60. However, as soon as the lever is oscillated either in a clockwise or counter-clockwise direction the spring will be raised by the pin 68 so that the curved edge 88 will frictionally engage the shaft 80 and the spring will be bowed over the pin.

To better understand the operation of the device let it be supposed that the lever 60 has been moved to a left-hand signalling position L. Movement to such position causes the pin 68 to elevate the edge 88 and bring the end *a* into frictional engagement with the shaft 80. This frictional engagement is substantially greater than the bias exerted by the springs 42, 44 tending to restore the pin 48, and with it the spring 66, to neutral position.

It will be observed furthermore that the frictional engagement between the spring 66 and the shaft 80, although sufficient to detail the spring in its extreme left-hand position, is less than the frictional engagement between the spring and shaft as the spring approaches said position due to the fact that the end *a* of the remote edge 88 is slightly closer to the screw 24 than the immediately adjacent portion of the edge. Although such refinement is not essential, it aids in detaining the lever in its operative position when, due to long use, the frictional engagement between the spring and shaft lessens.

It is understood that when the lever is moved to its left-hand turn indicating position the shaft 80 is stationary since it is part of the friction wheel which is in engagement with the hub 10 that then is stationary.

If, with the lever in position to indicate a left-hand turn, the steering wheel is turned in a counter-clockwise direction to make such a left turn, the friction wheel will turn in a clockwise direction. This will tend to turn the spring in a counter-clockwise direction about the screw 24. However, the lever 60 already has been moved to its maximum counter-clockwise position as fixed by abutment against an end of the slot 65. Accordingly, the shaft 80 will slide against the edge 88 of the spring and the spring will not move. Subsequently to complete the steering operation the steering wheel will be swung in a counter-clockwise direction. This will reverse the direction of the friction wheel and cause the spring to be urged in a clockwise direction. Nothing prevents such movement. Accordingly the movement will continue until the pin 68 reaches the depression 90. At this time the biasing springs 42, 44 will restore the lever 60 to its neutral position.

A similar operation is performed when the lever is moved to its right hand turn position at which time the end *b* frictionally engages the shaft 80.

It thus will be seen that I have provided a device which achieves all the objects of my invention and is well adapted to meet the conditions of practical use.

As various possible embodiments might be made in the above invention and as various changes might be made in the embodiment above set forth it is to be understood that all matter herein described or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention I claim as new and desire to secure by Letters Patent:

1. A self-cancelling mechanism adapted for use in connection with a signal control device that includes a switch having an operating part which is movable between a neutral position and an operative position, said device further including a pivoted operating lever for actuating the operating part and said device being adapted for use in connection with a rotatable member: said self-cancelling mechanism comprising a friction member which turns with the rotatable member, a traction member, means mounting said traction member for bodily movement toward and away from the friction member, said traction member being spaced from said friction member when the lever is in neutral position, and means kinematically interconnecting the traction member and lever and moving said traction member bodily in a direction parallel to the pivotal axis of the lever toward and into frictional engagement with the friction member when the lever is moved to operative position.

2. A self-cancelling mechanism adapted for use in connection with a signal control device that includes a switch having an operating part which is movable between a neutral position and an operative position, said device further including a pivoted operating lever for actuating the operating part and said device being adapted for use in connection with a rotatable member which turns with the steering wheel of an automotive vehicle; said self-cancelling mechanism comprising a friction member which turns with the rotatable member, a traction member, means mounting said traction member for bodily movement toward and away from the friction member, said traction member being spaced from said friction member when the lever is in neutral position, and means kinematically interconnecting the traction member and lever and moving said traction member bodily in a direction parallel to the pivotal axis of the lever toward and into frictional engagement with the friction member when the lever is moved to operative position.

3. A self-cancelling mechanism adapted for use in connection with a signal control device that includes a switch having an operating part which is movable between a neutral position and an operative position, said device further including a pivoted operating lever for actuating the operating part and said device being adapted for use in connection with a rotatable member which turns with the steering wheel of an automotive vehicle; said self-cancelling mechanism comprising a friction member which turns with the rotatable member, a traction member, means mounting said traction member for bodily

movement toward and away from the friction member, said traction member being spaced from said friction member when the lever is in neutral position, means kinematically interconnecting the traction member and lever for rotating the traction member when the lever rotates, and means to bodily shift the traction member in a direction parallel to the pivotal axis of the lever toward and into frictional engagement with the friction member when the lever is moved to operative position.

4. A self-cancelling mechanism adapted for use in connection with a signal control device that includes a switch having an operating part which is movable between a neutral position and an operative position, said device further including a pivoted operating lever for actuating the operating part, and said device being adapted for use in connection with a rotatable friction member which turns about an axis in the plane of and inclined to the pivotal axis of the operating lever: said self-cancelling mechanism comprising a first traction member, means mounting said first member on said lever for movement toward and away therefrom in a direction parallel to the pivotal axis of the lever, said first member having an arcuate edge remote from the pivotal axis of the lever, a second member, said second member being carried by the rotatable member and extending at an angle over the remote edge of the first member, said edge being spaced from said second member in neutral position and being movable into engagement therewith by movement of the first member in a direction parallel to the pivotal axis of said operating lever, and a stationary third member for moving the remote edge of the first member into engagement with the second member when the lever is oscillated on its pivotal axis.

5. A self-cancelling mechanism adapted for use in connection with a signal control device that includes a switch having an operating part which is movable between a neutral position and an operative position, said device further including a pivoted operating lever for actuating the operating part, and said device being adapted for use in connection with a rotatable friction disc which engages a part that turns with the steering wheel of an automotive vehicle: said self-cancelling mechanism comprising a leaf spring, means mounting said spring on said lever, said spring having an arcuate edge remote from the pivotal axis of the lever, a friction member carried by said disc, the arcuate edge of said spring being spaced from said friction member when the lever is in neutral position, means mounting said spring for movement toward and away from said friction member, and stationary camming means shifting the arcuate edge of said spring into frictional engagement with said friction member when the lever is rocked away from neutral position.

6. A self-cancelling mechanism adapted for use in connection with a signal control device that includes a switch having an operating part which is movable between a neutral position and an operative position, said device further including a pivoted operating lever for actuating the operating part, and said device being adapted for use in connection with a rotatable friction disc which engages a part that turns with the steering wheel of an automotive vehicle: said self-cancelling mechanism comprising a leaf spring, means mounting said spring on said lever, said spring having an arcuate edge remote from the pivotal axis of the level, a friction member carried by said disc, the arcuate edge of said spring being spaced from said friction member when the lever is in neutral position, means mounting said spring for movement toward and away from said friction member, and stationary camming means lifting the arcuate edge of said spring into frictional engagement with said friction member when the lever is rocked away from neutral position.

7. A self-cancelling mechanism adapted for use in connection with a signal control device that includes a switch having an operating part which is movable between a neutral position and an operative position, said device further including a pivoted operating lever for actuating the operating part, and said device being adapted for use in connection with a rotatable friction disc which engages a part that turns with the steering wheel of an automotive vehicle: said self-cancelling mechanism comprising a leaf spring, means mounting said spring on said lever said spring having an arcuate edge remote from the pivotal axis of the lever, a friction member carried by said disc, the arcuate edge of said spring being spaced from said friction member when the lever is in neutral position, means mounting said spring for movement toward and away from said friction member, and stationary camming means in the path of travel of the spring to lift the same into frictional engagement with said friction member when the lever is rocked away from neutral position.

8. A self-cancelling mechanism as set forth in claim 7 wherein the friction member leans over the arcuate edge of the spring.

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