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DELAYED ACTION SWITCH

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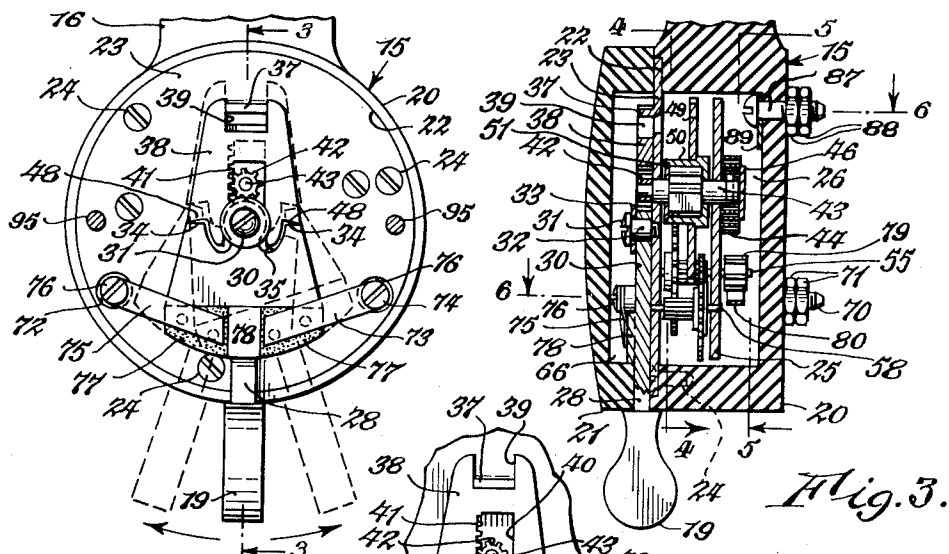


Fig. 1. Fig. 3.

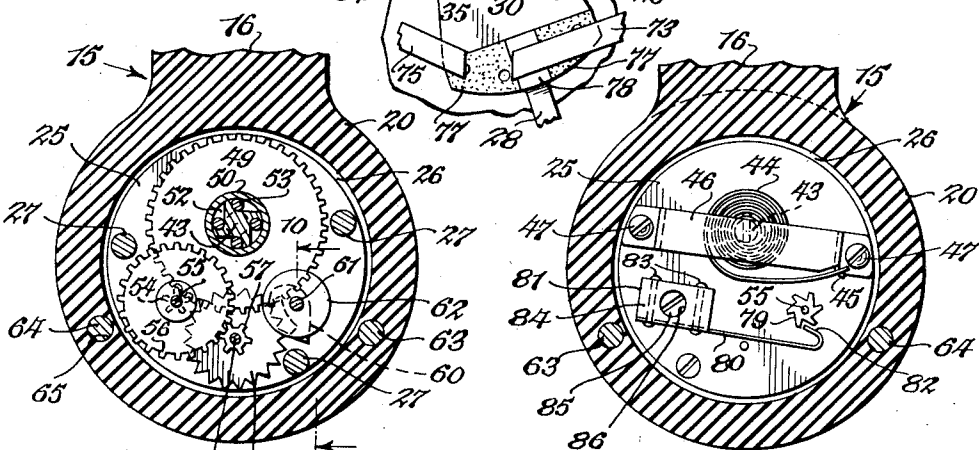


Fig. 2. Fig. 5.

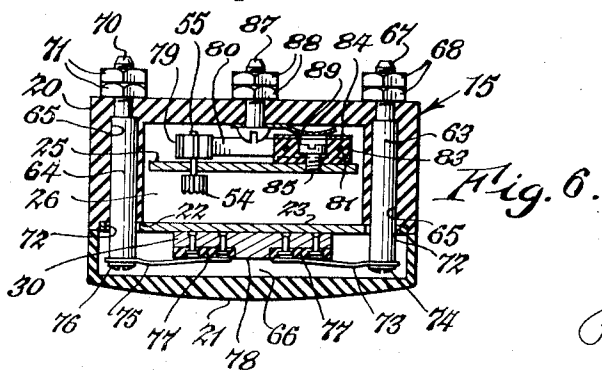


Fig. 4. Fig. 6.

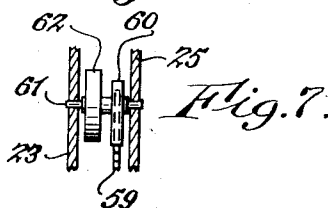


Fig. 7.

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DELAYED ACTION SWITCH

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9 Claims. (Cl. 200—35)

This invention relates to delayed action controlling apparatus, such as may be used, for example, in direction signal system for vehicles and the like, or in parking meters, where one may selectively operate any of a plurality of signal devices and said devices will remain in indicating position or condition for any selected interval of time, and then return to non-indicating position. More particularly the invention relates to an improved switch or master circuit controlling device by which the indicating devices may be selectively controlled.

An object of this invention is to provide an improved delayed action switch, with which either of a pair of indicating devices may be rendered effective selectively, and when so rendered effective will remain effective for a predetermined interval of time, with which the period of effectiveness may be different for the different signals, and with which an intermittent and repeated operation or flashing of either signal may occur during the time interval in which it is effective, and which will be exceptionally compact, dependable in operation, durable and inexpensive in construction and equally effective in all of the different positions in which it may be placed in use.

Another object of the invention is to provide an improved delayed action switch for parking meters and for direction indicators for vehicles and the like, of the type in which the particular signal to be displayed is rendered effective by selective movement of a controlling member in one direction or the other, and with which the mechanism will be fully enclosed against dust, dirt, moisture and atmospheric conditions.

Various other objects and advantages will be apparent from the following description of an embodiment of the invention, and the novel features will be particularly pointed out hereinafter in connection with the appended claims.

In the accompanying drawing:

Fig. 1 is a sectional plan of the improved switch of signal apparatus constructed in accordance with this invention, the section being taken approximately below the cover;

Fig. 2 is a sectional plan similar to Fig. 1 but illustrating only a portion thereof, and with the controlling element shifted into one operative position such as to cause actuation of the signal indicating an intention of the driver to make a right turn;

Fig. 3 is a sectional elevation through the switch device, the section being taken approximately along the line 3—3 of Fig. 1;

Fig. 4 is another sectional elevation through the switch device, the section being taken approximately along the line 4—4 of Fig. 3;

Fig. 5 is another sectional elevation of the same, the section being taken approximately along the line 5—5 of Fig. 3;

Fig. 6 is another sectional view of the same, with the section taken approximately along the line 6—6 of Fig. 3; and

Fig. 7 is a sectional elevation through a portion only of the clock train of the switch device, the section being taken approximately along the line 7—7 of Fig. 4.

In the illustrated embodiment of the invention, direction indicating devices, not shown, are mounted front and rear on opposite sides of the vehicle so as to indicate, when the signals are effective, the intention of the driver to make a left or right turn.

The signal devices are all selectively controlled by a switch device 15 which is mounted in a position convenient for operation by the driver of the vehicle, in any suitable manner, such as on the steering post 17 of a vehicle.

The switch device 15 is provided with a housing 20 of suitable electrical insulating material, and this housing has a removable closure or cap 21 also of suitable insulating material, such as, for example, molded hard rubber or the various molded synthetic resins. The open face of the housing 20 against which the cover 21 abuts is provided with an annular groove 22 in which a metallic plate 23 may be countersunk, so that the cover 21 may fit tightly against the open face of the housing 20. The plate 23 is secured in countersunk position in any suitable manner, such as by screws 24 which pass through and are countersunk in the plate 23 and are threaded into the open face of the housing 20. The plate 23 serves as a convenient medium for mounting the clock train and some portions of the switch mechanism as a unit in the housing 20. Another metallic plate 25 is disposed within the chamber 26 of the housing 20 and in spaced parallel relation to the plate 23, in any suitable manner such as is usual in clock work trains or by spacing studs 27, Fig. 4.

The operating handle 19 is provided on a reduced shank or stem 28 which passes through a slot 29 provided in the rim of the cover 21 which abuts against the open face of the housing. Within the housing the stem 28 is connected to a lever or operating member 30 which is pivoted at one end to the plate 23 such as by a screw or

stud 31, and the stem 28 may conveniently be an integral extension of the lever or member 30. The handle 18, stem 28 and lever 30 together form a common operating member by selective manipulation of which the particular signal systems may be rendered effective in a selected manner. A screw 31 is threaded into the plate 23, and has a shoulder abutting against the same to limit the extent to which it is threaded therein, and a cylindrical portion 32 on the shank of the screw 31 passes through the lever 30 and serves as a convenient pivotal bearing for the lever, the lever being confined against removal by the head of the screw. A washer 33 may also be provided on the screw 31 between its head and the lever 30, and this washer overlies the adjacent end portion of the rack 38 to confine the latter against the plate 23 without limiting its reciprocation.

The lever 30 is provided at its pivoted end, on opposite sides of the screw 31, with abutments 34 which are preferably approximately in a common plane passing approximately through the pivotal axis of the lever 30, which is the axis of screw 31, and notches 35 connect the abutments 34 to the boss portion 36 of the lever 30 which forms the bearing section through which screw 31 passes. The boss portion 36, by reason of the notches 35, is substantially more than half a cylinder for a reason which will appear presently. A tongue or lug 37 is struck outwardly from the plate 23 so as to form a guide for one end of a reciprocating rack or member 38. The rack 38 may have a slot or aperture 39 in one end thereof which fits over the lug 37, and by which the lug 37 guides that end of the rack for endwise reciprocation toward and from the screw 31. The other end of the rack 38 is provided with a notch or slot 40 which opens outwardly through that end and slidably embraces the partially cylindrical boss 36 of the lever 30. Thus the rack 38 will be guided near one end for endwise reciprocation and confined against lateral movement by the lug 37 having a sliding engagement with the slot 39, and near its other end by the section 36 of the lever 30 which acts as a guide stud for the adjacent end of the rack 38, while permitting substantial lateral rocking of the lever 30 about the pivot screw 31.

One side wall of the slot 40 is provided with rack teeth 41, and these teeth 41 mesh with and drive a pinion 42 which is fixed on a shaft 43 passing through, between and rotatably supported in plates 23 and 25. A clock spring 44 is coiled about and anchored to that end of the shaft 43 which extends through and outwardly from the plate 25, that is, towards the bottom of the housing 20. The spring 44 may be secured to the shaft in the manner in which clock or main springs are commonly anchored to the driving shafts in clocks and watches, such as by engaging an aperture in the end of the spring over a hook in the shaft, or in any other suitable manner. The other end of the spring 44, while the spring is under a substantial initial tension, is anchored or engaged over a hook 45 provided on a bridge 46 which extends across the exposed end of the spring 44. The ends of bridge 46 are secured, such as by screws 47, to the rear plate 25 of the clock train. When the shaft 43 is rotated through its pinion 42 in one direction, it will coil up or tension the spring 44. Then when the pinion 42 is free to rotate, the spring 44 in unwinding will rotate the pinion 42 in the opposite direction. The end of the rack 38 which is nearest the lever 30 is provided with a pair of

abutments 48 which abut or engage against the abutments 34 on the adjacent end of the lever 30 whenever the rack 38 is shifted in a direction toward the screw 31.

As illustrated clearly in Figs. 1 and 2, the lateral rocking of the lever 30 will, through the engagement of the corresponding abutments 34 and 48, cam or force the rack 38 endwise in the same direction which is away from the screw 31, regardless of whether the lever 30 through its handle 19 is rocked to one side or the other of its intermediate position shown in full lines in Fig. 1. Thus when lever 30 is rocked sidewise in either direction from the intermediate position of Fig. 1, it will cam the rack 38 in a direction away from the screw, and in doing so the rack teeth 41 will rotate the pinion 42 and shaft 43 in a direction to wind up or tension further the spring 44. As soon as the lever 30 is released, the spring 44 will urge the pinion 43 in the opposite direction, and through the rack 38 and engaging abutments 34 and 48 will urge the lever 30 back into the intermediate position shown in Fig. 1. This return movement of the lever 30 however, is opposed by a suitable clock train or equivalent timing device, so that the return movement will require the lapse of a predetermined and selected interval of time.

While any suitable timer or clock train may be employed, that illustrated, which is the preferable type, includes a main drive gear 49 which is fixed on a concentric hub or housing 50. This hub or housing is cup shaped, with the shaft 43 passing through the bottom of the cup, and a plate 51 removably mounted on the open end of the cup or hub 50 has an aperture through which another portion of the shaft 43 extends. The portion of the shaft 43 within the chamber of the hub 50 is relatively large and provided with a plurality of ratchet notches 52 arranged about its periphery, with each notch progressing from end to end of the portion within the hub or gear 49. A roller 53 is provided in each notch 52, so that the rollers in the notches 52 form a one way clutch connection between the shaft 43 and the cup 50 fixed to the gear 49. The notches 52 are deeper along one side wall thereof than the other so that they form a well known type of one way clutch driving connection between the shaft 43 and the cup 50. They are so arranged that when the shaft 43 is rotated in a direction to tension the spring 44, which is clockwise in Figs. 1, 2 and 4, the rollers 53 will lie in the deeper part of the notch and will not exert any driving connection on the cup, so that the spring may be tensioned without any movement of the gear 49.

When the lever is released however and the spring 44 is free to act on the shaft 43 to rotate it in the opposite direction and return lever 30 to the intermediate position shown in Fig. 1, the rollers 53 will ride into the shallower ends of the notches and form a driving connection or clutch between the shaft 43 and the gear 49. The gear 49 meshes with and drives a pinion 54 provided on a shaft 55 which extends through and between the plates 23 and 25 and is rotatably supported thereby. The shaft 55 mounts a gear 56 which meshes with and drives a pinion 57 on a shaft 58 also rotatably supported by the plates 23 and 25. An escapement wheel 59 is also fixed on the shaft 58 for rotation therewith, and the teeth on the periphery of this escapement wheel cooperate with a pallet or escapement anchor 60 which is fixed on the shaft 61 also rotatably sup-

ported at its ends in the plates 23 and 25. On the shaft 61 I mount an inertia element 62, which is preferably a fly wheel balanced on the shaft 61.

Thus as the gear 49 is driven by the unwinding spring 44, its rate of travel will be retarded by the gear train formed of pinions and gears 54, 56, 57 and escapement wheel 59, and the teeth of the latter will rock the pallet or anchor 60 back and forth and in doing so will rock the balance wheel back and forth in opposite directions. The gear train can operate only at a speed permitted by the rocking of the anchor or pallet 60 and the oscillation of balance wheel 62. No hair spring is necessary on this type of escapement, and by using the balanced inertia element 62 it operates with the same retarding effect whether disposed in one position or another during use. Thus as the spring 44 slowly unwinds at a rate permitted by the escapement device formed of anchor 60, balance wheel 62 and escapement wheel 59, it returns at a slow rate, the lever 30 and handle 19 to the intermediate position shown in Fig. 1 regardless of whether the handle 19 was moved to one side or the other of the intermediate position shown in Fig. 1. One of such lateral positions is shown by full lines in Fig. 2.

Contact posts 63 and 64 are disposed in recesses 65 provided in the wall of the housing 20, so as to extend through the bottom of the housing 20 and into the chamber 66 provided beneath the cover 21. The stud or post 63 is provided with a reduced, threaded end 67 which extends through the bottom wall of the housing 20, and there it carries a pair of nuts 68. By tightening these nuts against the bottom face of the housing 20, they serve to draw the shoulder 69 of the stud 63 firmly into anchored position in the recess 65. The other binding post or stud 64 is also provided with a reduced, threaded end portion 70 which passes through the bottom wall of the housing 20 and there carries nuts 71 by which the post 64 may be firmly anchored in the wall or housing 20. The other ends of the posts 63 and 64 which extend into the chamber 66 of cover 21, pass through apertures 72 in the plate 23, the apertures 72 being made larger than the studs 63 and 64 so that there will be no electrical contact between the studs 63 and 64 and the plate 23.

A leaf contact spring 73 is removably secured in any suitable manner such as by a screw 74 to that end of the post 63 which extends into that chamber 66 of cover 21, and a similar leaf contact spring 75 is removably secured in any suitable manner such as by a screw 76 to the corresponding projecting end of the post or stud 64. The contact springs 73 and 75 extend toward one another over the outer face of the lever 30, and bear upon such outer face of the lever 30 with sufficient friction to normally retain the lever 30 in different positions into which it may be adjusted, but the friction is not sufficient to prevent manual operation of the lever 30 nor its return by the spring 44 to the intermediate position. Blocks 77 of electrical insulating material are mounted on this outer face of the lever 30, so as to abut against a raised contact portion 78 of the lever 30 which is disposed between the insulating blocks 77. The outer faces of the contact section 78 and the insulating block 77 are flush with one another.

When the lever 30 with its handle 19 is in the intermediate position, shown in Fig. 1, the contacts 73 and 75 will bear at their free ends upon

the insulating blocks 77 in close proximity to but spaced from the contact section 78 of the lever 30. When the handle 19 is operated to one side or the other, the contact section 78 of the lever 30 will be carried beneath one or the other of the contacts 73 or 75, as shown in Fig. 2, and the engagement of this contact section 78 with the contact spring such as 73, which is shown in Fig. 2 as being a contact therewith, will complete an electrical circuit between the lever 30 and the stud or post 63. If the handle 19 is shifted in the other direction from the intermediate position, such as to the left in Fig. 1, the contact section 78 will be carried into contacting engagement with the spring contact 75 which is carried by the post or stud 64 and complete an electric circuit thereto.

The shaft 55 of the clock train extends through and beyond the plate 25, and on its outer projecting end carries a ratchet shaped element or wheel 79, Figs. 3, 5 and 6. Leaf spring 80, which is anchored at one end to a block 81 of insulating material, extends into proximity to the member 79 and is provided with a bent end 82 which is adapted to snap over the teeth of the member 79 when the latter is rotated by the clock train during the unwinding of the spring 44. The end 82 is so positioned that when it snaps into a notch between adjacent teeth of the member 79, it will not engage physically, or make an electric contact with, the member 79 but when the teeth of the member 79 move around in a clockwise direction in Fig. 5 during the unwinding of spring 44, they will engage in succession with the bent end 82 of contact 80 and intermittently make and break electrical contact therewith for a purpose which will appear presently.

The spring 80 may be anchored to the insulating block 81 in any suitable manner such as by rivets 83, and the anchored end of the spring 80 may have a lateral flange 84 which extends along one side face of the insulating block 81, which would be the side face toward the bottom or inner end wall of the housing 20, as shown in Fig. 6. The block 81 is secured to the rear clock train plate 25 in any suitable manner, such as by a screw 85 the head of which is countersunk into a recess in the side face of the block 81 over which the flange 84 is disposed, the head of the screw being below the flange 84, and the latter may have an aperture 86 therein through which access may be had to the head of the screw 85. A bolt 87 passes through the bottom or inner end of the housing 20 and carries nuts 88 on its outer end. The head of the bolt 87 is within the housing 20, and it clamps against the bottom wall of the housing a leaf spring 89 which bears against the flange 84 of the contact spring 80.

In the use of this improved signal device let it be assumed that the handle member 19 is in the intermediate position shown by full lines in Fig. 1, at which time none of the signal devices is effective. If now the driver decides to make a right turn he merely grasps the handle member 19 and moves it to the right into the position shown by full lines in Fig. 2. During this movement the abutment 34 on the right hand side of the lever 30 in Fig. 2, by engagement with the right hand abutment 48 of the rack 38 will cam the rack endwise in a direction away from the screw 31 and will rotate the pinion 42 in a clockwise direction in Figs. 1 and 2. This winds or tensions the spring 44 to a greater extent, it being understood that the spring 44 will be under sub-

stantial tension even when the lever 30 is in its intermediate position.

When the handle 19 is thus shifted to the right, as shown in Figs. 1 and 2, the contact section 78 of the lever 30 will be moved beneath the contact 73 which is frictionally bearing on the lever 30, and an electric circuit will be established to one signal device.

The lever 30 is held in the position in which it is released by the friction of the spring arm 73 thereon, but the spring 44 of the clock train is sufficient to slowly force the lever back to the intermediate position. Until the lever 30 has substantially reached its intermediate position, the circuit through one set of the lamps or signal devices will remain normally closed by the reason of the engagement with the spring contact arm 73 with contact section 78 of the lever 30, but subject to the intermittent opening and closing of the same circuit by the engagement and disengagement of the teeth of the member 79 with the bent end 82 of contact spring 80. Thus, the signal lamps will be flashed intermittently for a selected interval of time while the member 19 is being returned to intermediate position, and when the latter happens the movement of the contact section 73 from beneath the spring 73 will definitely open the circuit lamps and thus stop the indication at those lamps.

If the handle 19 is shifted to the left instead of the right in Fig. 1, the spring 44 of the clock train will be tensioned in a similar manner, and the contact section 78 of the lever 30, instead of being carried beneath the spring arm 73, will be carried beneath the spring contact arm 75 and a circuit to the other signals or lamps through the binding post 64 will be established. The contact spring 73 or 75 which at any time is not in contacting engagement with the section 78 of the lever 30 will be riding upon one of the insulating blocks 77 on the lever 30. When the member 19 is released, it will be slowly returned to the intermediate position at a rate regulated by the clock train, and inasmuch as the spring 80 of the flashing device is in the portion of the circuit common to both pairs of signals or lights, the lamps or signal devices then effective will be similarly flashed intermittently during this predetermined interval in which they remain effective.

It will be noted that the edge of the lever 30 from which the stem 28 extends is arcuate and has a curvature whose center is at the screw 31, and the screw 31 is located at the center of the curvature of the chamber 66 in the cover, so that during the rotation of the lever 30 its outer arcuate edge will lie along the inner edge of the slot 29 and close the same in all of the different positions into which the handle 19 may be manipulated. This prevents the entry of dust and moisture into the casing. The cover 21 may be removably secured in closed position in any suitable manner, such as by screws 95 which pass through the cover into the housing 20. The wire 94, screw bolt 87, contact springs 83 and 80, toothed member 79 and the body of the clock train as well as the lever 30, form the main body of a circuit having divided branches through the contact springs 73 and 75 in which the signal lamps are placed, so that the flashing device is in the undivided part of a divided branch circuit, with the signal lamps or devices disposed in the branch circuits. Hence, one flashing device will function satisfactorily for both branch circuits and all of the signal devices, inasmuch as only one of

the sets of signal devices is operating at one time.

Another application of the invention is to parking meters. In either vehicle signals or parking meters, the slot 29 in the cover 21 of the housing, which limits the movement of the handle 19 in either sidewise direction may be made shorter on one side than the other from the intermediate, normal position of the handle, so that when the handle is moved to one side of the intermediate position, the extent of its movement from its intermediate position, and consequently the time interval during which the handle is being returned to initial, intermediate position, will be less for one sidewise movement than for the other. Consequently the duration of display of one signal will be for a lesser predetermined period than for the other signal. Thus in a parking meter one may selectively determine in advance, by proper prepayment and operation of handle 19, which of a selection of different time intervals will govern the parking time, and different signals so selectively rendered effective will indicate for which time period payment has been made. The details of the coin control of the handle 19 are not disclosed because they form no part of the present invention and are divisible subject matter. Other applications of the improved delayed action switch will suggest themselves to those skilled in the art.

It will be understood that various changes in the details, materials and arrangements of parts, and applications or uses of the invention, which have been herein described and illustrated in order to explain the nature of the invention, may be made by those skilled in the art within the principle and scope of the invention, as expressed in the appended claims.

I claim as my invention:

1. In an electric switch for use in a direction signal system for vehicles and the like, and of the type in which one contact device is closed by a lever when said lever is moved to one side of an intermediate position, another contact device is closed by said lever when said lever is moved to the other side of said intermediate position, and neither contact device is closed by said lever when said lever is in said intermediate position, comprising said lever, a spring driven clock train, said lever having a pair of abutments disposed approximately on diametrically opposite sides of the pivotal axis of said lever, a rack member having one end abutting against said abutments on opposite sides of said axis, and operable endwise in a direction away from said axis by the engagement of the end of the rack with the lever abutment on either side of said axis, means including a pinion meshing with and operable by said rack for winding the spring of said clock train in the same direction when the lever is moved to either side of said intermediate position and by which said clock train when free returns said lever to said intermediate position.

2. An electric switch of the type adapted for use in a vehicle signal system or the like in which two different circuits are selectively closed by movement of a controlling lever in either direction from a neutral position and held closed for a selected interval of time and then automatically opened, which comprises said lever pivoted for movement in both directions from an intermediate position and having a pair of abutments disposed one on each side of the pivotal axis of said lever and both in a plane passing approximately through said pivotal axis of the lever, a rack member mounted for reciprocation in a di-

rection toward and from said pivotal axis and having surfaces engageable with said abutments on said lever whenever said lever is moved in either direction away from said intermediate position, by which said rack member is moved endwise upon movement of said lever in said either direction, a spring, means operated by said rack when said lever is moved in either direction from said intermediate position for winding said spring and by which the spring returns said rack to initial position and said lever to said intermediate position whenever said lever is released, a clock train having a one way clutch connection to said spring by which said clock train is idle while said spring is being wound and which retards the unwinding of said spring when said lever is released.

3. A master controlling device for signal systems for vehicles and the like which comprises a lever having a partially cylindrical surface on one end edge thereof, means concentric with said cylindrical surface for pivoting said lever for movement laterally in both directions from an intermediate position, said lever having at its pivoted end, and at diametrically opposite sides of said pivoting means, a pair of abutments, a member having a slot at one end embracing the cylindrical surface of the pivot end of said lever and guided in reciprocation by said cylindrical end toward and from said pivoting means, additional means acting with said member and guiding it in reciprocation toward and from said pivoting means, said member having a pair of abutments engageable with the pair of abutments on said lever when said member is nearest said pivoting means and said lever is in said intermediate position, whereby movement of said lever in either direction from said intermediate position will move said member in one direction away from said pivoting means, timing means tensioned by said member when moving in said one direction and operable on said member to return it to initial position nearest said pivoting means and through it return said lever to said intermediate position after the lapse of a predetermined interval of time, switch means operable by said lever whenever said lever is away from said intermediate position for selectively controlling different circuits depending upon to which side of said intermediate position, said lever has been moved, and additional switch means in series with said before mentioned switch means and operable by said timing device during its operation in returning said lever to said intermediate position for additionally intermittently making and breaking the circuits controlled by said first mentioned switch means as they are rendered operative by movement of said lever away from said intermediate position.

4. In an electric switch for use in a vehicle signal system or the like and of the type in which a control lever selectively controls two separate circuits, one of which is rendered effective when said member is moved in one direction from an intermediate position and the other of which is rendered effective when the control lever is moved in the opposite direction from said intermediate position, that improvement which comprises said lever pivoted for oscillation in both directions from said intermediate position, said lever having a pair of abutments, one on each side of the pivotal axis of the lever and approximately in a common plane passing through said pivotal axis, a rack abutting against said abutments on opposite sides of said pivotal axis and operable thereby

endwise of itself away from said pivotal axis upon oscillation of said lever in either direction from said intermediate position, a clock train, a spring anchored at one end, a gear meshing with and driving said clock train, a shaft to which the other end of said spring is connected and on which said gear is rotatably mounted, a one-way clutch connection between said gear and shaft which yields when said shaft is operated to tension said spring, a pinion on said shaft and meshing with said rack, whereby endwise movement of said rack away from said axis will wind said spring, and said spring will return said control lever to said intermediate position from either side of that position in which said lever may be moved, upon release of said lever, and said return will be retarded by said clock train.

5. In an electric switch for direction signal systems of vehicles and the like, and of the type in which either of two signal circuits may be selectively closed by a controlling member shiftable in both directions from an intermediate position, and retained in closed position for a selected interval of time and then opened, that improvement which comprises said member mounted for movement in either direction from an intermediate position, a clock train including a driving gear, a shaft having a one-way clutch connection to said gear, a spring anchored at one end and connected at its other end and under substantial tension to said shaft, and wound by rotation of said shaft in one direction during which said gear remains idle, said spring when said shaft is released unwinding in a direction to drive said gear, a pinion drivingly connected to said shaft, a rack mounted for reciprocation and meshing with said pinion to rotate the same, said member having cam surfaces operable selectively and alternately on said rack for moving it endwise in the same direction whenever said member is moved in either direction from an intermediate position, and said rack acting on the cam surfaces of said member to return said member to said intermediate position by the unwinding of said spring when said member is released.

6. In a signal system for vehicles and the like, of the type in which branches of a divided circuit leading to different signal devices are selectively closed and held closed for a selected interval of time and then opened, that improvement in the controlling mechanism for such circuit branches which comprises a manually operated controlling lever pivoted at one end for selective movements in opposite directions from an intermediate position, a rack disposed in endwise position to the pivoted end of said lever, and operable in the same direction away from said pivot by portions of the pivoted end of said lever which are on both sides of the pivot, when the lever is rocked in either direction from said intermediate position, a spring device geared to and tensioned by movement of said rack in said same direction and operable to return said lever to said intermediate position from each side thereof when said lever is released, means including a clock train for retarding the return of said lever through said rack by said spring to said intermediate position, whether the lever has been moved to one side or the other of said intermediate position, said clock train having a one-way clutch connection to said spring and rack to permit tensioning of said spring by said rack without operation of said clock train, said train also including therein means to regulate its rate of operation.

7. In a direction signal system for vehicles and the like in which different signals are selectively rendered effective and held effective for a selected interval of time, by movement of a pivoted lever laterally in both directions from an intermediate position which is then released, that improvement in the control of said lever which comprises said lever having, adjacent its pivotal axis, a pair of abutments on opposite sides of said axis and both in a common plane passing approximately through said axis, a member mounted for reciprocation toward and from said axis approximately crosswise of the line joining said abutments and in a direction parallel to the plane generated by the movement of said lever, and itself having a pair of abutments similarly engageable with the abutments on said lever when said lever is in said intermediate position, whereby the movement of said lever in either of said lateral directions from said intermediate position will cause endwise movement of said member in one direction, a spring operated timing device operable on said member to return it to said initial position in which both of its abutments engage both of the abutments of said lever and by engagement with one abutment or the other of the lever, return the lever to said intermediate position following release of said lever, said timing device being operable at a relatively slow rate while returning said member to initial position having a one-way clutch enabling free movement of said member away from said axis whereby said lever may be operated rapidly in either direction from said intermediate position, and will be returned slowly to said intermediate position by said spring actuated timing device.

8. In direction signal systems for vehicles and the like of the type in which a plurality of circuits are selectively controlled by a lever which is moved laterally in opposite directions from an intermediate position, that improvement in the controlling means for said lever, which comprises said lever, a pivot mounting said lever for movement laterally in both directions from an intermediate position, said lever having a partially cylindrical surface on its end edge nearest the pivot and with said surface concentric with the axis of said pivot, said lever also having a pair of abutments at its pivoted end at diametrically opposite sides of said pivot, a member having a

slot at one end slidably embracing the cylindrical surface on the pivoted end of said lever and guided in reciprocation by said cylindrical end toward and from said pivot, additional means guiding said member in reciprocation toward and from said pivot, said member having a pair of abutments engageable with said pair of abutments on said lever when said member is nearest said pivot and said lever is in said intermediate position, whereby movement of said lever in either direction from said intermediate position will, through engagement of said member with the abutment on either side of said pivoting means, force said member endwise away from said pivot, and timing means tensioned by said member when moving in said one direction and permitting free and rapid movement of said member in that direction, and operable, when said lever is released, on said member to return it at a predetermined rate to initial position nearest said pivot and through it return said lever to said intermediate position.

9. In a signalling system for vehicles and the like of the type in which a controlling lever is swung in both directions from an intermediate position in order to render one signal or another effective, and which is returned by a spring motor to intermediate position after the lapse of a predetermined interval of time, that improvement in the switch mechanism for controlling said signals which comprises said lever formed of metal, insulating blocks secured on said lever in spaced relation to one another in the direction of movements of said lever from said intermediate position, the outer faces of said insulating blocks being approximately flush with the outer face of that portion of the metal of said lever which is disposed between said blocks, spring contact members bearing on the faces of said insulating blocks in spaced relation to the metal between said blocks when said lever is in said intermediate position, whereby movement of said lever in either direction from said intermediate position will cause said one or the other of said contact members to engage the metal of said lever between said blocks, and the other contact member will continue to ride on the same insulating block on which it has been riding.

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