Jan. 2, 1940. J. E. REGNAS 2,185,569

DIRECTION INDICATOR SWITCH

Filed March 15, 1939 2 Sheets-Sheet 1

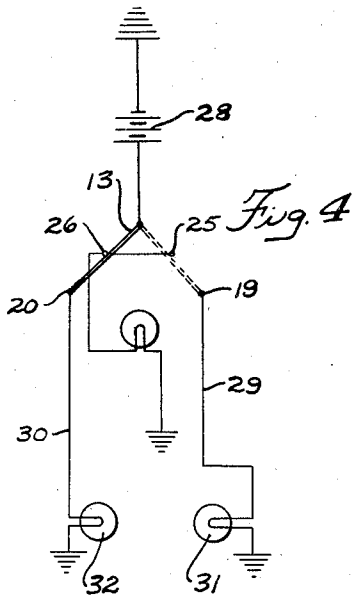


Fig. 4

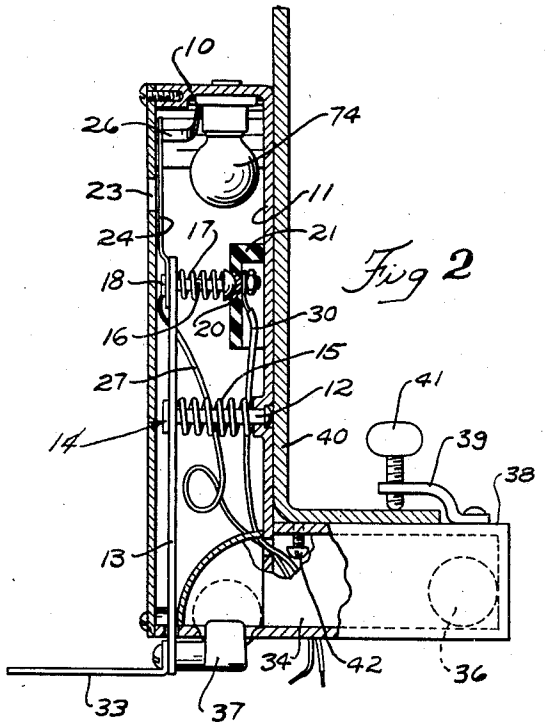


Fig 2

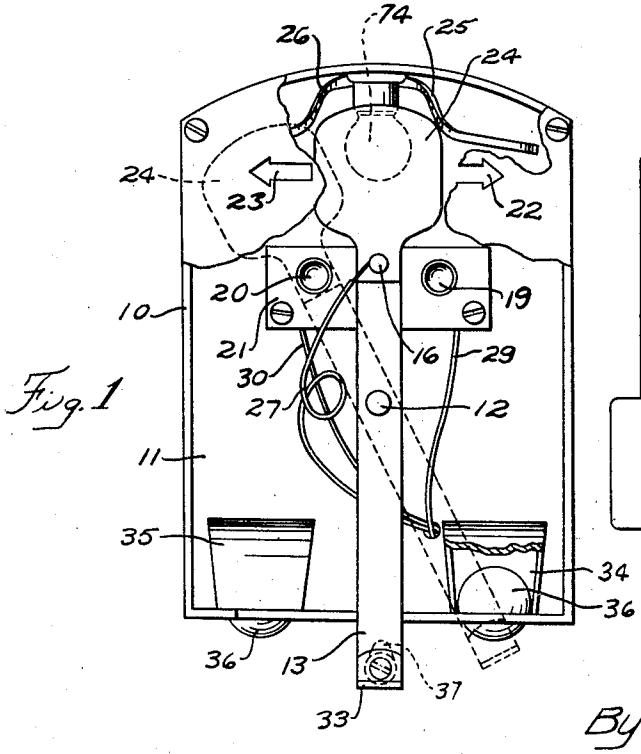


Fig. 1

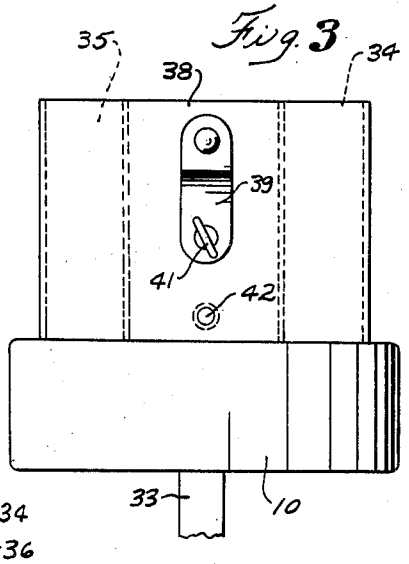


Fig. 3

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Jan. 2, 1940. J. E. REGNAS 2,185,569

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Filed March 15, 1939 2 Sheets-Sheet 2

Fig. 6

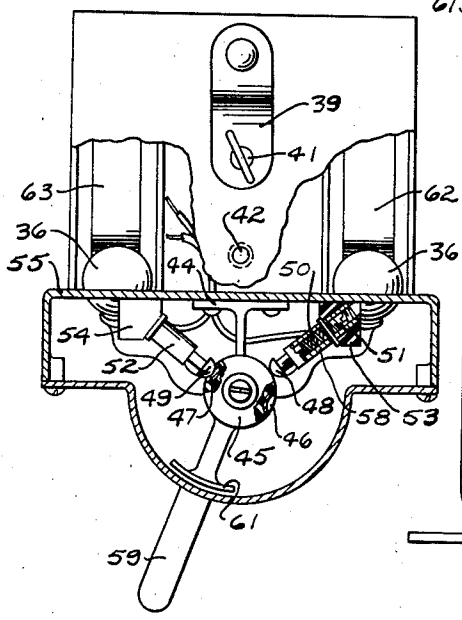


Fig. 7

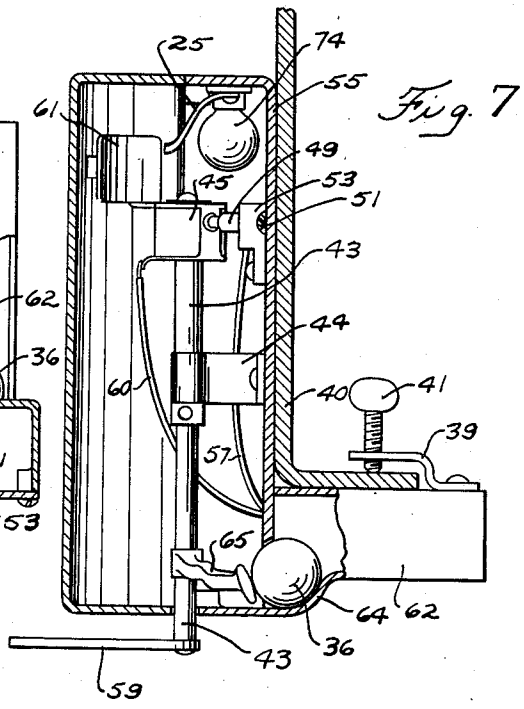
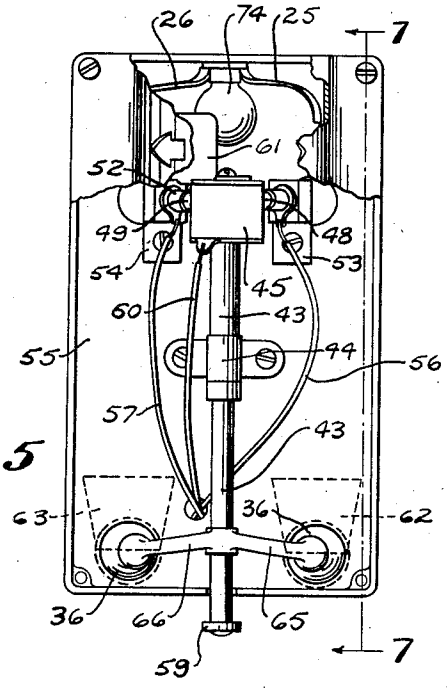


Fig 5



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DIRECTION INDICATOR SWITCH

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11 Claims. (Cl. 200—59)

This invention relates to a switching device for the control of direction signals such as are employed, for example, upon motor vehicles to indicate in advance directions in which the vehicle will turn. A primary object of the invention is to provide means which will automatically return the switch mechanism to a neutral position following an operation of the switch to energize one of the signals.

A further important object of the invention is to make the automatic return means operable responsive to vehicle speed changes. The invention is based upon the principle that in making a turn the vehicle will be normally proceeding at a much lower rate of speed than it will acquire following that turn. The return mechanism is actuated in response to this increase in speed following the turn.

These and other objects and advantages of the invention residing in the particular unique combinations of elements will become apparent to those versed in the art in the following description of the invention as illustrated in the accompanying drawings, in which

Fig. 1 is a front elevation in partial section of a structure embodying the invention;

Fig. 2, a vertical section through the device showing the switch in an actuated position;

Fig. 3, a top plan view;

Fig. 4, a wiring diagram;

Fig. 5, a front elevation of a modified form of the invention with the front wall broken away;

Fig. 6, a top plan view in partial section of the modified form; and

Fig. 7, a vertical section on the line 7—7 in Fig. 5.

Like characters of reference indicate like parts throughout the several views in the drawings.

Referring first to that form of the invention as illustrated in Figs. 1–3, I form a housing 10 in any suitable shape, herein shown as generally box-shape, to have a rear wall 11 carrying an axle 12 on which is rockably mounted a switch arm 13. This arm 13 is normally urged into an outermost position against a head 14 on the axle 12 by means of a compression spring 15, the tension of which is quite light. Above the axle 12, a pin 16 is fixed to the arm 13 to extend forwardly and terminate by a rounded head. A compression spring 17 surrounds the pin 16 to bear compressively by its ends against the inner face of the arm 13 and the head of the pin 16, the pin 16 being free to slide axially through the arm 13. A head 18 on the outer end of the pin 16 limits the inward travel of the pin.

The head of the pin 16 is in the path of a number of contact members, herein shown as two in number and designated by the numerals 19 and 20. These members 19 and 20 are mounted in any suitable manner on an insulating block or panel 21 fixed to the back 11. Preferably these members 19 and 20 are provided with cupped faces into which the head of the pin 16 may drop a slight distance so that when the arm 13 is rocked toward either one of these members 19 or 20, the head of the pin 16 may drop into those members and thus tend to hold the member 13 in that rocked position under the urging of the spring 17 against the pin head. The spring 17 is formed to exert a light pressure so that the arm 13 may be readily rocked from that held position.

The front wall of the box 10 is provided preferably with two windows 22 and 23, each formed in the shape of an arrow, one oppositely directed from the other as indicated in Fig. 1. On the upper end of the arm 13 is carried a shield 24. When the arm 13 is rocked, this shield 24 will be selectively carried behind either one of these two windows. For example, when the arm 13 is rocked to the dash line position as shown in Fig. 1, the shield 24 will be behind the window 23 so that light coming from a lamp 74 mounted in the upper end of the box 10 will be prevented from shining through the window 23 but will cause light to appear back of the window 22.

The base of the lamp 74 has one side of its circuit grounded to the wall of the box 10 and the other side connected to a pair of metallic arms 25 and 26 which extend into the path of the shield 24 to be contacted thereby respectively as that shield is rocked toward the arms. The shield member 24 may carry a contacting member or may itself be made entirely of metal as herein shown, to have a wire 27 leading from any suitable source of current, such as the battery 28 of the motor vehicle, connected thereto with sufficient slack as to permit the free swinging of the arm 13. This same wire 27 also connects with the pin 16. Wires 29 and 30 lead respectively from the contact members 19 and 20 to the direction signals of any desired type, herein shown as consisting essentially of the lamps 31 and 32. These lamps are grounded for the return circuit.

The arm 13 is actuated by an extension member 33 carried to any suitable position. One such position would be located in the path of the knee of the driver of the motor vehicle so that the operator could push his knee to one side or the other to swing the member 33 accordingly and thus operate the switch. From the description so

far given, the mechanism provides for the closing of a circuit selectively to one of the two signals 31 and 32. Of course, the extension member 33 may be pushed to carry the arm 13 back to its central position to open that circuit. However, it often occurs that the driver is engaged with other duties following the turn of the vehicle and forgets to change the switch and thus leaves a turn signal indication which is confusing, if not dangerous, to the operation of traffic following. In order to return the switch arm 13 automatically to its neutral position, the following mechanism is provided.

I provide a pair of V-shaped troughs 34 and 35 extending forwardly from the wall 11 of the box 10 in substantially horizontal and parallel alignment. At the forward end of each trough is provided a suitable depression or opening into which a ball 36 may drop. This ball 36, one for each trough, is made sufficiently large so that its weight will serve as the actuating factor to shift the arm 13. In practice, this ball should be at least three-quarters of an inch in diameter and made out of iron or steel, or at least of some metal having considerable weight for that volume. The lower end of the arm 13 is provided with a forwardly turned foot 37, the upper portion of which is given a generally wedge-shape and so located as to enter the depression or opening into which the ball 36 drops. The length of the arm 13 below its axle 12 is made to be such that when the arm 13 is rocked to either side, the foot 37 will swing into the ball opening and lift the ball 36 up to the level at which it will roll forwardly in its trough. That is, the foot 37 kicks the ball 36 up away from the rear end of the trough and allows it to roll to the extreme forward end thereof. The troughs 34 and 35 are adjusted in practice to have their forward ends normally slightly below the rear ends whereby the ball 36 will roll under the influence of gravity to the forward ends in each case. However, this slope of the troughs does not depart much from the horizontal for the reason that when the motor vehicle is speeded up following the turn, the inertia effect of the ball 36 in each case will permit it to travel relatively back to the rear end of the trough in each case and drop into the depression over its lower opening and strike the foot 37 appearing in one of the openings with sufficient force to kick the foot laterally from that opening and thus swing the arm 13 away from its closed circuit position which is the position of the arm 13 as indicated in solid lines in Fig. 1. Since there are two troughs and a ball in each trough, this action will occur in the same manner regardless of which position the arm 13 may be in for the closed circuit condition. A plate 38 extends across the top sides of the troughs 34 and 35, Fig. 3, and carries a mounting bracket 39 of any suitable shape, herein shown as of a type to be swung around over an inturned foot of the motor vehicle dash or instrument board 40. A thumb screw 41 screw-threadedly passes downwardly through the bracket 39 against the top side of the foot. In order to adjust the troughs 34 and 35 to the slight departure from the horizontal positions, a suitable adjusting means is provided. In the form herein shown, this means takes the form of a screw 42 screw-threadedly passing upwardly through the central part of the plate 38 just ahead of the wall 11, Figs. 2 and 3. This screw may be carried through the plate 38 to abut the under side of the foot of the member 40 and thus lower the rear ends of the troughs. Thus the troughs may be rocked about the forward edge of this foot member.

In the other form of the switch, illustrated in Figs. 5–7, the same general operation of employing the inertia effect to cause balls to return the switching mechanism to a neutral position is employed. However, the actual mechanism is varied to employ a central operating shaft 43 which is guided through any suitable means such as a bracket 44 which permits turning of the shaft therethrough but restrains it against longitudinal travel. The upper end of the shaft 43 carries a drum 45 on which is mounted two contact members 46 and 47 to be carried selectively into contact with the respective brush members 48 and 49 each spring-pressed thereagainst. As illustrated in Fig. 6, brush 49 consists of a cylindrical pin with an externally enlarged head, slidingly guided within a tube 50 carrying a spring 50 abutting the inner end of the brush and a screw 51 screw-threadedly entering the tube as a means for varying the pressure of the spring against the brush. The brush 49 is carried in the same manner by its tube 52. Both tubes are suitably mounted on insulating members 53 and 54 respectively secured to the back wall 55 of the switch housing. From each of these tubes 52 and 58 are carried the wires 56 and 57 to the respective turn signals. A lever 59 is fixed to the lower end of the shaft 43 as the switch operating means. Thus by throwing the lever 59 either to the left or to the right, the brushes 49 and 48 are selectively brought into contact with the members 47 and 46 on the drum 45. These two members 46 and 47 are interconnected with the wire 60 which leads to the source of current such as the battery 26 as indicated in the diagram, Fig. 4. For simplicity, and following the usual practice, the switch is illustrated as using the single wire system with ground return. The lamp 74 is carried in the upper end of the switch housing with its one side grounded to the housing and the other side in common connection with both of the arms 25 and 26.

In this second form of the invention, a shield 61 is mounted on the top side of the drum 45 to be carried selectively around behind the windows 22 and 23 in the forward side of the housing to give the visual signal to the operator as to the position of the switching mechanism. This shield 61 in the present form is made out of metal and is connected in series with the wire 60 to make selective contact with either arm 25 or 26 as the position of the shield may be. In other words, the lamp 74 is illuminated only in either of the two closed circuit positions of the drum 45. This same situation prevails in the first form of the invention in that the lamp 74 is likewise illuminated only in either of the two closed circuit positions of the switch arm 13.

As indicated in this second form of the invention, two ball troughs 62 and 63 are attached to the lower end of the switch housing to extend forwardly from the wall 55 in parallel alignment. In each of these troughs is mounted a metallic ball 36 as in the first form. In the rear end of each trough is a depressed part 64 into which the ball may drop. Fixed to the shaft 43 are a pair of arms 65 and 66 having their outer ends terminating respectively in substantial contact with the balls 36 when both of those balls are in the depressed parts of their troughs and the shaft 43 is in the open circuit position. The outer end of each arm 65 and 66 is preferably provided with

a foot tilted backwardly from the vertical as indicated in Fig. 7, so that when the shaft 43 is rotated in either direction, that foot which is carried into the opening through the wall 55 against the ball 36 there appearing will lift the ball 36 up out of the depression to carry the ball to that elevation wherein it may then roll freely forwardly in its trough. It is understood that the wall 55 carries an opening through which the arms 65 and 66 may enter to travel against the respective balls resting in the depressions at the ends of the respective troughs. It is to be understood, of course, that the troughs 62 and 63 are so adjusted in their mounting that there is a slight inclination downwardly toward their forward ends so as to cause the balls to travel in that direction following their lifting by the arms 65 and 66. Of course, it is to be understood that when the shaft 43 is rotated to either closed circuit position, only one of the balls 36 will be lifted. For example, when the arm 65 is carried around to lift the ball 36, Figs. 5 and 7, then the arm 66 is being carried away from the other ball 36 without causing any shifting thereof. The return movement of the ball 36 under increase in speed of the vehicle will cause the ball 36 to drop down into its pocket at the rear end of its trough and strike against the foot of the arm there appearing and thus knock the arm back out of the way.

In this form of the invention, the neutral or open circuit position is fixed by reason of the feet of the arms 65 and 66 being contacted by both balls 36 simultaneously It is to be noted that in this second form, the shield 61 travels within a limited arc and advantage of this fact is taken in that the forward side of the switch housing is made to be curved correspondingly.

Thus it is to be seen that in both of the forms of the invention herein shown and described, the switch mechanism is initially operated to give the desired turn signal. No further manual operation of the signal is required since the switch mechanism will return to its normal open circuit condition by speeding up the vehicle following the making of the turn indicated. Since it is the normal procedure in operating a motor vehicle to return the vehicle to its faster rate of speed following a turn, the inertia effect is transmitted through the balls to automatically return the mechanism to that open circuit condition. Of course, the operator at all times has a visual indication immediately before him as to the condition of the switching mechanism since either one of the windows 22 or 23 will be illuminated in accordance with the actuated signal and will remain dark when neither signal is being actuated.

While I have herein shown and described my invention in the best form as now known to me, it is obvious that structural variations may be employed without departing from the spirit of the invention and I, therefore, do not desire to be limited to that precise form beyond the limitations as may be imposed by the following claims.

I claim:

1. In a switching device for direction indicators, a vertical housing having a pair of windows, a lamp in the housing, a switch member in the housing having a shield and shiftable in a vertical plane to alternately cover the windows with the shield, a contact member in the path of said switch member optionally contacted by movement of the switch member, a shiftable weight member, means for carrying the weight member substantially horizontally to a forward position, a weight shifting member actuated by said switch member to initiate at least movement of the weight member toward said position when contact is made, said weight member being subject to inertia upon bodily movement of said device in the direction of said position, whereby said movement will cause said device to move ahead of movement of the weight member and cause it to strike said weight shifting member and return said switch member to an "off" position.

2. In a switching device for direction indicators, a vertical housing having a pair of windows, a lamp in the housing, a switch member in the housing having a shield and shiftable in a vertical plane to alternately cover the windows with the shield, a contact member in the path of said switch member optionally contacted by movement of the switch member, a shiftable weight member, means for carrying the weight member substantially horizontally to a forward position, a weight shifting member actuated by said switch member to initiate at least movement of the weight member toward said position when contact is made, said weight member being subject to inertia upon bodily movement of said device in the direction of said position, whereby said movement will cause said device to move ahead of movement of the weight member and cause it to strike said weight shifting member and return said switch member to an "off" position, said shiftable weight member consisting of a ball, and said carrying means consisting of a trough.

3. In a switching device for direction indicators, a vertical housing having a pair of windows, a lamp in the housing, a switch member in the housing having a shield and shiftable in a vertical plane to alternately cover the windows with the shield, a contact member in the path of said switch member optionally contacted by movement of the switch member, a shiftable weight member, means for carrying the weight member substantially horizontally to a forward position, a weight shifting member actuated by said switch member to initiate at least movement of the weight member toward said position when contact is made, said weight member being subject to inertia upon bodily movement of said device in the direction of said position, whereby said movement will cause said device to move ahead of movement of the weight member and cause it to strike said weight shifting member and return said switch member to an "off" position, said shiftable weight member consisting of a ball, and said carrying means consisting of a trough, and a pocket at the rear end of the trough receiving and normally retaining the ball.

4. In a switching device for direction indicators, a vertical housing having a pair of windows, a lamp in the housing, a switch member in the housing having a shield and shiftable in a vertical plane to alternately cover the windows with the shield, a contact member in the path of said switch member optionally contacted by movement of the switch member, a shiftable weight member, means for carrying the weight member substantially horizontally to a forward position, a weight shifting member actuated by said switch member to initiate at least movement of the weight member toward said position when contact is made, said weight member being subject to inertia upon bodily movement of said device in the direction of said position, whereby said movement will cause said device to

move ahead of movement of the weight member and cause it to strike said weight shifting member and return said switch member to an "off" position, and means yieldingly retaining said switch member in the contacting or "on" position.

5. In a switching device for direction indicators, a vertical housing having a pair of windows, a lamp in the housing, a switch member in the housing having a shield and shiftable in a vertical plane to alternately cover the windows with the shield, a contact member in the path of said switch member optionally contacted by movement of the switch member, a shiftable weight member, means for carrying the weight member substantially horizontally to a forward position, a weight shifting member actuated by said switch member to initiate at least movement of the weight member toward said position when contact is made, said weight member being subject to inertia upon bodily movement of said device in the direction of said position, whereby said movement will cause said device to move ahead of movement of the weight member and cause it to strike said weight shifting member and return said switch member to an "off" position, said shiftable weight member consisting of a ball, and said carrying means consisting of a trough, and a pocket at the rear end of the trough receiving and normally retaining the ball, and means for adjusting the inclination of said trough.

6. In a switching mechanism, a rockable switch arm, a pair of spaced apart contact members, a brush member on the arm, a pair of spaced apart troughs disposed substantially horizontally and extending forwardly of the arm, a pocket at the rear end of each trough having an opening therein, a ball carried in each trough, and a foot on the arm formed to strike the ball through the pocket opening upon the arm being swung theretoward and lift the ball from the pocket into its trough and to be pushed away from the opening upon return travel of the ball as it drops back into the pocket, a housing having a pair of windows, a lamp, a shield shifted alternately between a window and the lamp and means for completing an electric circuit to the lamp when the shield is between the lamp and a window.

7. In a switching mechanism, a rockable switch arm, a pair of spaced apart contact members, a brush member on the arm, a pair of spaced apart troughs disposed substantially horizontally and extending forwardly of the arm, a pocket at the rear end of each trough having an opening therein, a ball carried in each trough, and a foot on the arm formed to strike the ball through the pocket opening upon the arm being swung theretoward and lift the ball from the pocket into its trough and to be pushed away from the opening upon return travel of the ball as it drops back into the pocket, a housing about said arm, a pair of windows in the housing, a shield shifted by travel of the arm to behind either of the windows, a lamp, said shield traveling between the lamp and the windows, and means placing the lamp in a closed electric circuit when the shield is in either of its shifted positions.

8. In a switch mechanism, a shaft, a pair of troughs, a ball carried in each trough to roll away from the switch by gravity and return under inertia influence, a pocket at one end of each trough into which the ball may drop, each pocket having an opening therein through which the ball may be pushed back up into its trough, said shaft being located near said pockets and spaced therebetween, an arm extending from the shaft to each pocket opening terminating by an end shaped to lift the ball from its pocket, said shaft being mounted to be axially rotatable, and said balls being normally in their respective pockets at said arm ends to retain the shaft in a neutral position, a pair of contact members relatively stationary, at least one contact member carried by travel of said shaft against either of the members in said pair, and means for rotating said shaft, one of said arm ends being carried against one of said balls to lift it into its trough while the other arm end is withdrawn from and rocked away from the other ball upon turning of the shaft to either contact closing position.

9. In a switch mechanism, a shaft, a pair of troughs, a ball carried in each trough to roll away from the switch by gravity and return under inertia influence, a pocket at one end of each trough into which the ball may drop, each pocket having an opening therein through which the ball may be pushed back up into its trough, said shaft being located near said pockets and spaced therebetween, an arm extending from the shaft to each pocket opening terminating by an end shaped to lift the ball from its pocket, said shaft being mounted to be axially rotatable, and said balls being normally in their respective pockets at said arm ends to retain the shaft in a neutral position, a pair of contact members relatively stationary, at least one contact member carried by travel of said shaft against either of the members in said pair, and means for rotating said shaft, one of said arm ends being carried against one of said balls to lift it into its trough while the other arm end is withdrawn from and rocked away from the other ball upon turning of the shaft to either contact closing position, said pair of contact members being yieldingly pressed into the path of said one contact member to effect releasable engagement upon registering therewith, said engagement being overcome by weight of the returning ball dropping into its pocket and striking the arm end there appearing.

10. In a switch mechanism, a shaft, a pair of troughs, a ball carried in each trough to roll away from the switch by gravity and return under inertia influence, a pocket at one end of each trough into which the ball may drop, each pocket having an opening therein through which the ball may be pushed back up into its trough, said shaft being located near said pockets and spaced therebetween, an arm extending from the shaft to each pocket opening terminating by an end shaped to lift the ball from its pocket, said shaft being mounted to be axially rotatable, and said balls being normally in their respective pockets at said arm ends to retain the shaft in a neutral position, a pair of contact members relatively stationary, at least one contact member carried by travel of said shaft against either of the members in said pair, and means for rotating said shaft, one of said arm ends being carried against one of said balls to lift it into its trough while the other arm end is withdrawn from and rocked away from the other ball upon turning of the shaft to either contact closing position, a housing about said shaft, a shield rotatable with the shaft, a pair of spaced apart windows in the housing selectively covered by the shield, a lamp behind the shield, and means for placing the lamp in an electrical circuit at either position of said shield covering a window.

11. In a switching device for direction indicators, a vertical housing having a pair of windows, a lamp in the housing, a switch member in the housing having a shield and shiftable in a vertical plane to alternately cover the windows with the shield, a contact member in the path of said switch member optionally contacted by movement of the switch member, a shiftable weight member, means for carrying the weight member substantially horizontally to a forward position, a weight shifting member actuated by said switch member to initiate at least movement of the weight member toward said position when contact is made, said weight member being subject to inertia upon bodily movement of said device in the direction of said position, whereby said movement will cause said device to move ahead of movement of the weight member and cause it to strike said weight shifting member and return said switch member to an "off" position, and friction means tending to retain said switch member in any position to which it may be shifted.

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