The present invention relates to a signaling system for automotive vehicles and, more particularly, to such a system which is under the control of the accelerator mechanism to give a caution signal while the accelerator mechanism is moving from an operating position towards its inactive position and to give a danger signal when the accelerator mechanism is in its inactive position.

Hereinafter, systems of the foregoing character have been proposed, but have not been used extensively because they were unduly complicated and too costly.

Accordingly, an object of the present invention is to provide an improved system of this type which is simple and economical in construction.

Another object is to provide such a system wherein a switch is utilized which is constructed of a minimum number of parts and is adapted to be readily assembled and installed.

A further object is to provide such a switch which is reliable in operation and does not comprise any parts which need frequent replacement or repair.

Other and further objects will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

In accordance with the present invention, the foregoing objects are accomplished by providing a system under the control of the accelerator mechanism which comprises a danger signal circuit including a contact member, a caution signal circuit including a contact plate, a shoe slideable across the contact plate carrying a contact member in both of the circuits, and means operated by the accelerator mechanism for effecting movement of the shoe. The shoe is tiltably mounted in such a manner that, while the accelerator mechanism is in an operating position, the contact element does not engage the contact plate but, while the accelerator mechanism is moving from an operating position towards its inactive position the shoe will tilt and cause the contact element to engage the contact plate, whereby the caution signal circuit is closed. As the accelerator mechanism reaches its inactive position, the shoe tilts to cause the contact element to disengage the contact plate and to now engage the contact member, whereby the danger signal circuit is closed.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawing, forming a part of the specification, wherein:

Fig. 1 is a side view partly in section and partly in elevation, illustrating a switch in accordance with the invention and an accelerator pedal for operating the switch shown in its inactive position.

Fig. 2 is a sectional view taken along the line 2—2 on Fig. 1.

Fig. 3 is a sectional view taken along the line 3—3 on Fig. 1.

Fig. 4 is a view similar to Fig. 1 illustrating the switch when the accelerator pedal is adjacent its fully operated position and partial retraction of the accelerator has just begun, but omitting the accelerator pedal.

Fig. 5 is a wiring diagram illustrating the electrical circuits utilized in the system.

Referring to the drawing in detail and, more particularly to Figs. 1 to 3 thereof, there is shown an accelerator pedal 10 pivotally mounted at 11 on the floor 12 of an automobile or the like, and a switch in accordance with the invention generally indicated by the reference numeral 14.

The switch 14 comprises a frame, which is illustrated herein as a small box or casing 15 having the top thereof secured to the underside of the floor 12 by screws 16. The operating elements of the switch are positioned in this box and comprise a contact member 17 on the underside of the top of the box adjacent one side thereof, a contact plate 19 mounted on a slide 20 of non-conductive material secured to the interior of the side of the box adjacent the contact member 17, and a contact element 21 carried by a shoe 22 of non-conductive material slidably associated with the slide 20 in the manner about to be described. The contact element 21 is secured to the shoe 22 by a conductive screw 23, as shown. It is of course understood that the screw 23 may be recessed in the contact element 21 so that the contact element engages the contact member 17.

As shown in Fig. 2, the slide 20 includes a lengthwise extending guideway provided by a pair of non-conductive side flanges 24 between which the shoe 22 is positioned for sliding movement.

The contact plate 19 is positioned between the flanges 24 in a recess at the upper portion of the slide, and is secured by a bolt or screw 25 and a nut 26.

The shoe 22 has an undercut or recessed portion 27 at the upper end which enables the shoe
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The shoe is tiltably supported by a connection associated with means for moving the shoe along the slide. This means comprise an accelerator operating rod 30 substantially parallel to the slide, slidably mounted in bearings 31 at the top and bottom of the box and connected to the underside of the pedal 10 by a ball-like projection 32 at the upper end of the rod and a guideway 34 (Fig. 3) for slidably receiving the projection, whereby pivotal movement of the pedal effects longitudinal movement of the rod. These means further comprise an arm in the form of a sleeve or tube 35 secured to the rod 30 between the bearings 31, and a second arm in the form of a plunger 36 slidably supported by the sleeve. The free end of the plunger is formed with a head 37 retained in a casing 38 secured to the shoe to provide a universal connection, which facilitates tilting of the shoe. A spring 40 housed in the sleeve urges the plunger against the shoe with sufficient pressure to bear against the slide.

In operation, when the accelerator pedal 10 is in its upper or inactive position and fuel is not being supplied to the engine, the shoe 22 is parallel to the slide plate 19 and the contact element 21 is electrically connected to the contact member 17 through screw 23. Upon pushing down the pedal to supply fuel to the engine, the shoe rides on the slide in parallelism therewith from its upper position, as shown in Fig. 1, to its lowermost position, whereby the contact element 21 neither engages the contact member 17 nor the contact plate 19. However, after the pedal has been pushed down and pressure thereon is relaxed to cause a spring (not shown) to move the pedal or operating rod 30 upwardly, such upward movement of the rod and the sleeve and plunger carried thereon enables the shoe to tilt by reason of the universal connection, as shown in Fig. 4, wherein the contact element 21 engages the contact plate 19. As the shoe ascends, the element 21 remains in contact with the plate 19 until it approaches its upper position, but the shoe then tilts back into parallelism with the slide to cause the element 21 to disengage itself from the plate 19 and re-engage the contact member 17.

By operation of the switch elements in the foregoing manner a caution and a danger circuit can be controlled, such circuits being shown in Fig. 5. The caution circuit includes a signal, such as a yellow lamp 45, adapted to be energized by a battery 46 or other source of electrical energy when the element 21 contacts the plate 19. The danger circuit includes a signal, such as a red lamp 47, adapted to be energized by the battery 46 when the element 21 through screw 23 engages the contact 17. In this manner, neither lamp is energized during acceleration, that is, when pressure is maintained on the pedal 10: the yellow lamp 45 is energized as the pedal moves upwardly to indicate slowing down, and the red lamp 47 is energized when fuel is no longer supplied to the engine, because the opener is about to stop the vehicle or is merely coasting.

From the foregoing description, it will be seen that the present invention provides a simple, practical and economical signaling system for automotive vehicles. The switch which controls this system is sturdy in construction, but yet is relatively small in size and light in weight, and is fully capable of withstanding such frequent usage to which it may normally be subjected. The switch and the signaling system in accordance with the invention is readily installed on either new or existing vehicles.

As various changes may be made in the form, construction and arrangement of the parts herein, without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matters are to be interpreted as illustrative and not in any limiting sense.

What is claimed is:

1. A switch for a signaling system of the class described comprising a frame, a contact member on said frame, a slide on said frame having an end adjacent said contact member, a contact plate on said slide at the end adjacent said contact member, a shoe mounted for sliding movement on said slide, means for moving said shoe along said slide including a connection for tiltably supporting said shoe, and a contact element on one end of said shoe adapted to be connected to said contact member when said shoe is at one end of said slide and adapted to engage said contact plate when said shoe is tilted with respect to said slide.

2. A switch according to claim 1, wherein said slide includes a guideway for said shoe.

3. A switch according to claim 1, wherein said means include a spring for biasing said shoe against said slide to prevent tilting of said shoe while moving on said slide away from said contact member.

4. A switch according to claim 1, wherein said means include an operating rod substantially parallel to said slide and spaced therefrom, means on said frame for mounting said rod for lengthwise sliding movement, an arm connected to said rod for movement therewith extending towards said slide, a second arm slidably connected to said first-mentioned arm for lengthwise movement thereon, and a spring for engaging said arms to urge them apart, said tiltably supporting connection being at the free end of said second arm.

5. A switch according to claim 4, wherein said first arm is a tubular sleeve and said second arm is a plunger slidably mounted in said sleeve and said spring is disposed in said sleeve in contact with the end of said plunger within said sleeve.

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