July 5, 1932. N. RALPH 1,866,422

ELECTRIC SWITCH DEVICE

Filed May 11, 1931

Fig. 1.

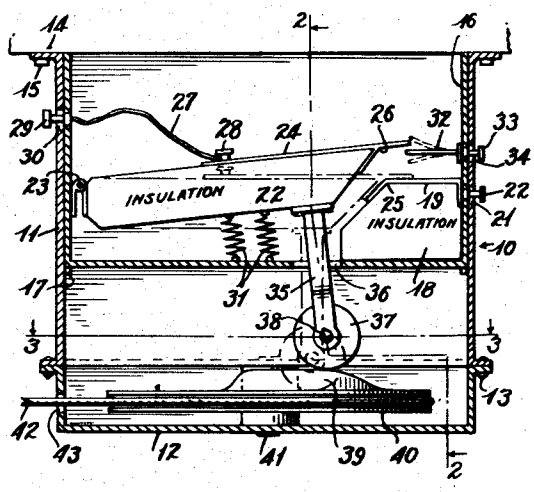


Fig. 2.

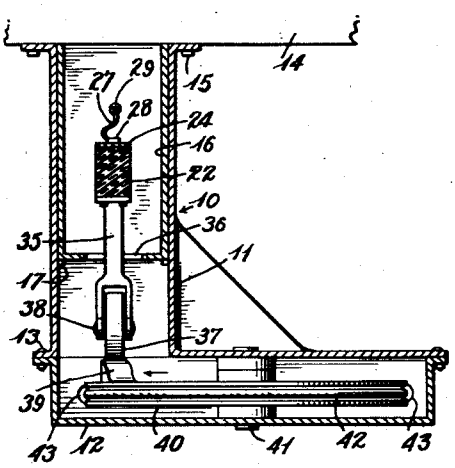


Fig. 3.

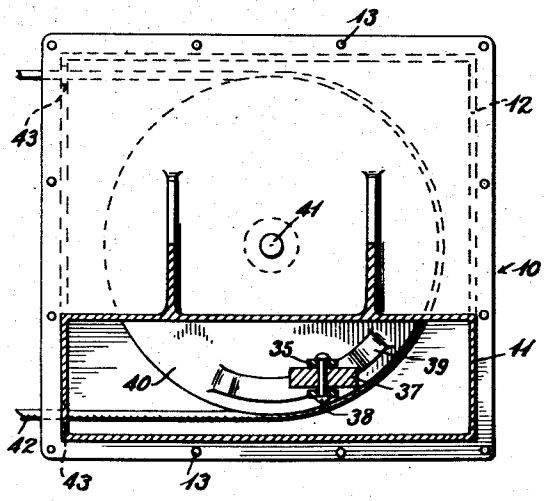
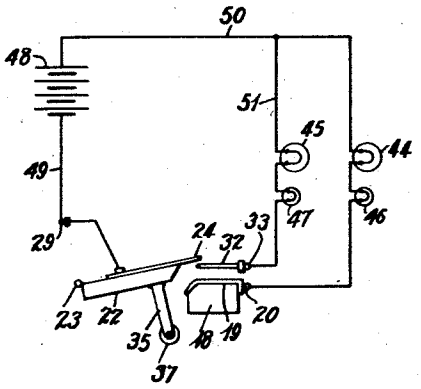


Fig. 4.



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UNITED STATES PATENT OFFICE

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ELECTRIC SWITCH DEVICE

Application filed May 11, 1931. Serial No. 536,634.

The invention relates to a switch mechanism particularly adapted to control caution and stop signals on street cars, motor busses or other vehicles.

It is an object of the invention to provide a switch which will cause a caution signal to be given immediately before and after a stop signal and which may be controlled through the actuation of the air brake rigging employed on the car, buss or other vehicle.

A further object of the invention is to provide a novel yieldable contact coacting with the main movable contact to control the giving of the caution signal.

Further objects of the invention will appear from the following description when read in connection with the accompanying drawing showing an illustrative embodiment of the invention and wherein:—

Fig. 1 is a view of the switch mechanism in central longitudinal vertical section;

Fig. 2 is a sectional view taken on the plane of line 2—2 of Fig. 1;

Fig. 3 is a horizontal sectional view taken on the plane of line 3—3 of Fig. 1; and

Fig. 4 is a diagram of the electrical parts.

Referring specifically to the drawing, a casing is employe ' at 10 which may be of any suitable size, construction or material. Preferably such casing has an outer section 11 equipped with a removable bottom 12 secured in place by bolts 13. Said section 11 is adapted to be suspended from a sill or other part of a street car, bus or the like, as suggested at 14, being fastened in place by bolts or the equivalent 15. Enclosed by the section 11 is an inner section 16, removably resting on lugs 17 provided on the interior of section 11.

At one corner of section 16, a block of insulation 18 is anchored to which is fastened a metallic contact 19 having a binding post 20 fastened thereto and extending outwardly through an opening 21 in the section 11. An arm or bar 22, preferably of insulation, is hinged at 23 on a horizontal axis, within the section 16, and the same carries a metallic contact 24 adapted for engagement with the contact 19, such contacts 19 and 24 preferably being V-shaped at 25 and 26 at their zones of engagement.

A slack conductor 27 is fastened to a binding post 28 on contact 24 and to a binding post 29 carried by section 16 and projecting outwardly through an opening 30 in section 11. The weight of the arm 22 is sufficient to enable the same to fall so that the contacts 19 and 24 may engage. In addition, such arm 22 is urged downwardly by one or more contractile springs fastened thereto and to the bottom wall of the section.

The contact 24 is also adapted for engagement with a yieldable contact 32 which is normally straight and extends horizontally as shown in Figs. 1 and 4. Contact 32 is fastened to the section 16 and has a binding post 33 extending therefrom and through an opening 34 in the section 11.

Depending from the block 22 is a bracket 35 which passes through an opening 36 in the bottom wall of section 16 and which pivotally mounts a roller 37 at its lower end through the medium of a pin 38.

The switch is normally held in open position through the coaction or engagement of a cam 39 with said roller 37. Said cam 39 forms part of or is carried by a disc or drum 40 located within the section 11 and pivotally mounted by means of a pin 41. An actuating cable or equivalent flexible element 42 is trained over the periphery of the disc 40 and at both ends extends exteriorly of the casing and through openings provided therein at 43.

The mechanism is preferably used in connection with a stop lamp or signal 44 and a caution lamp or signal 45 located at any suitable position on the street car, bus or other vehicle.

A telltale lamp 46 is adapted to be illuminated at the same time as lamp 44 and a telltale lamp 47 is adapted to be illuminated at the same time as lamp 45. Said telltale lamps 46 and 47 are located adjacent the motorman or driver of the vehicle for ready observation.

The electric energy for the lamps 44 to 47 is supplied for instance by a battery 48 from one terminal of which a conductor 49 leads and is secured to the binding post 29. From the other terminal of the said battery 48, a conductor 50 leads, which includes the lamps 44 and 46 and which is fastened to the bind-

ing post 20. From the conductor 50, a branch conductor 51 extends to the binding post 23 and the same includes the lamps 45 and 47.

The cable 42 is adapted to be connected to a suitable movable part of the air braking rigging or the equivalent used on the street car or motor bus but obviously the same may be controlled by any moving part on the vehicle and in addition be controlled manually or both manually and through actuation of an air brake rigging so that in case of failure of the air brake rigging, the hand brake may be used to apply the signal.

Presuming operation, the signals 44 to 47 are normally extinct since the parts are in the full line position illustrated in Figs. 1 and 4, the switch being held open due to the engagement of cam 39 with roller 37. Should the air brake rigging or equivalent part on the street car or bus be moved, a drawing action will be given the cable 42 which will correspondingly rotate disc 40 and move the cam 39 wholly or partly out of engagement with the roller 37, enabling the arm 22 to gravitate toward closed position aided by the contractile spring means 31.

Downward movement of the arm 22 first causes engagement of the contacts 24 and 32, resulting in illumination of caution signal 45 and telltale 47. The contact 32 will bow or yield as suggested by the lower dotted lines in Fig. 1, thus giving the caution signal for a sufficiently long period.

If the cam 39 completely disengages the roller 37, as when the brake rigging is fully applied, the contact 24 completely disengages the contact 32 and engages the contact 19, as suggested by the dotted lines in Fig. 1, thus closing the electric circuit through the stop signal 44 and telltale 46. Upon the disc 40 being moved in the opposite direction by release the brake rigging or the equivalent cam 39 will reengage roller 37 thus elevating arm 22 and breaking the circuit through the stop signal 44 thereupon engaging the contact 32, reestablishing the circuit through caution signal 45 and then bowing the contact 32 and moving upwardly past the same whereby all of the signals are extinguished.

Minor changes may be made in the physical embodiment of the invention within the scope of the appended claims without departing from the spirit of the invention.

I claim:

1. A switch device having relatively movable contacts adapted for engagement, a third contact, all of said contacts being serially mounted, said third contact being engageable by one of the first mentioned contacts through said relative movement and having a free end disposed in the path of said relative movement, said third contact being yieldable whereby it will be released with a snap action prior to engagement of the first mentioned contacts.

2. A switch device having a first contact, a second contact movable to engage the same, a third contact to control a different means from that controlled by engagement of the first and second contacts, all of said contacts being serially mounted and said second and third contacts extending into the path of movement of each other and being displaceable one by the other by snap action as the second contact is moved into engagement with the first contact.

3. A switch device having a first contact, a second contact movable to engage the same, a third contact to control a different means from that controlled by engagement of the first and second contacts, all of said contacts being serially mounted, said second and third contacts extending into the path of movement of each other and being displaceable one by the other through snap action as the second contact is moved into engagement with the first contact and as the second contact is moved out of engagement with the first contact.

4. A switch device having a casing, an arm movably mounted therein provided with a contact, a relatively fixed contact in the casing engageable by the first contact, a yieldable contact in the casing above the fixed contact engageable by the first contact, said yieldable contact having a free end disposed in the path of movement of the first contact and being movable thereby with snap action out of said path, a projection on said arm, contractile spring means connected to the arm and casing urging movement of the arm toward the fixed contact, and cam means in the casing below said wall cooperating with the projection to control the engagement of said contacts.

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