

K. W. MANSFIELD & W. R. THOMPSON.

ELECTRIC SWITCH.

(Application filed July 6, 1900.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 2.

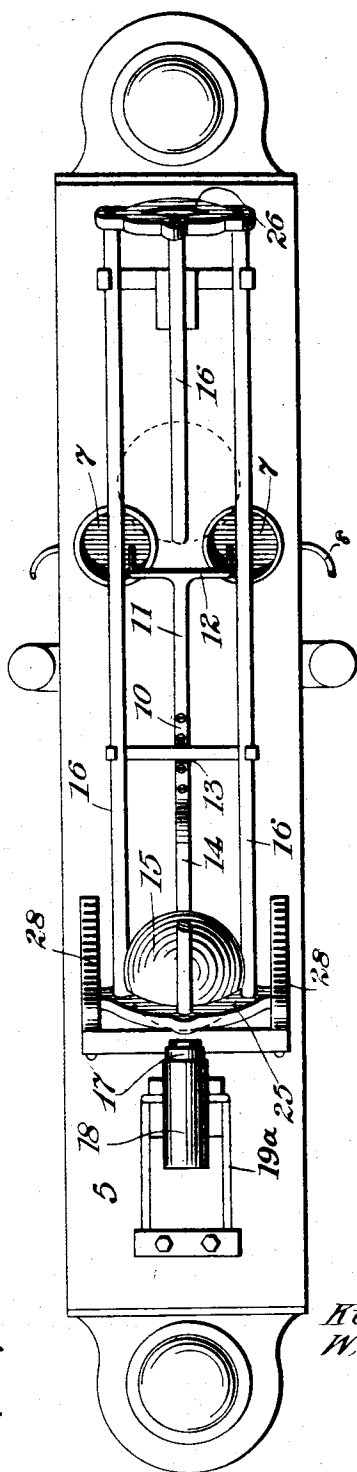
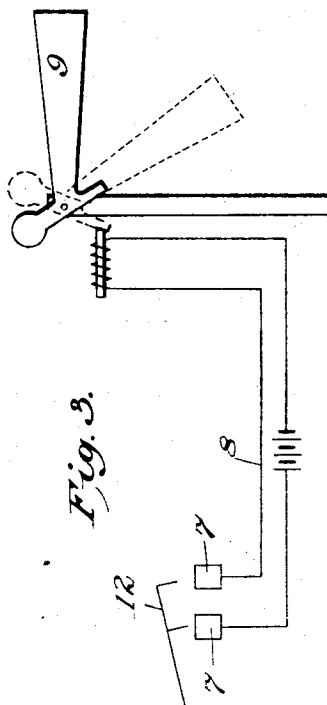


Fig. 3.



WITNESSES:

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ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 683,213, dated September 24, 1901.

Application filed July 6, 1900. Serial No. 22,731. (No model.)

To all whom it may concern:

Be it known that we, KING W. MANSFIELD and WILLIAM R. THOMPSON, citizens of the United States, residing at South Norwalk, Connecticut, have invented certain new and useful Improvements in Electric Switches, of which the following is a full, clear, and exact description.

Our invention relates to an electric switch apparatus; and it consists of the combinations hereinafter described and claimed.

In our former patent, No. 643,666, dated February 20, 1900, we disclosed a signal system, particularly useful on trolley or other railways, in which when a car leaves a turnout it closes an electrical circuit and sets a block-signal at the next turnout. This closure of the circuit was accomplished by the trolley-wheel touching a terminal of the signal-circuit, thus allowing a current to pass from the feed-wire through the signal-circuit. By the construction shown in that patent the signal-circuit would continue closed so long as the trolley-wheel remained in contact with the terminal of the signal-circuit, and if a car should stop in this position the apparatus might be burned out. The contact also was not reliable in all cases. In the embodiment of our invention shown here we have provided a switch apparatus which may be automatically actuated by the car, but which does not in the embodiment shown depend on the trolley-wheel for the current-supply. It makes no difference at what point the car stops, for the circuit will remain open until the car reaches a certain point, when it actuates the mechanism controlling the switch, and this mechanism then automatically closes the switch and reopens it after a suitable interval entirely independently of the movement of the car.

In the preferred embodiment of our invention shown in the drawings, Figure 1 represents a side elevation, parts being in section, of our switch in place above a trolley-wire. Fig. 2 shows a plan view of the same without the hood, and Fig. 3 shows a diagram of connections.

In the above preferred embodiment, 1 is a trolley-wire, preferably at a turnout, and 2 a

trolley-wheel carried on an arm 3 on a trolley-car 3^a.

4 4 are insulating-supports which carry the base 5, to which the switch mechanism is attached.

6 is a hood to cover and protect the parts from the weather.

7 7 are the terminals, preferably mercury-cups, of a circuit 8, Fig. 3, which in this embodiment controls a signal 9 at the next turnout or at any other desired point. We do not, however, limit ourselves to a visual signal, as a bell might be rung or a light displayed or other signals made. We have provided a switch which is thrown and returned automatically and independently of the movement of the vehicle. In the present embodiment this switch closes and then opens the circuit 8; but we do not limit ourselves to such construction.

10 is the switch, which includes in this embodiment a lever 11, carrying a contact-bridge 12, adapted to dip into the mercury-cups and close the circuit. This lever 11 is attached to an insulating-piece 13, pivoted at 13^a to the frame. A projection in the form of a lever 14 is attached to 13. In order to automatically throw and return the switch independently of the movement of the vehicle, we have provided a movable device adapted to rest in one position and automatic means to impart an impulse to said movable device to move it to a distance and throw the switch and means to automatically return the movable device to its former position, thus throwing back the switch. In this embodiment the movable device is a rolling object—for instance, a ball 15, which normally rests at the bottom of an inclined track or way formed by rods 16 16, sloping upward. The lever 14 projects into the path of movement of the ball, as shown by dotted lines, so that the ball strikes the same to throw the switch into the position shown in full lines. In this embodiment the switch is held open by the ball when it is at rest. When an impulse is given to the ball, it will roll up the incline by its momentum, thus releasing lever 14 and allowing lever 11 to drop by gravity or otherwise and close the circuit. The ball will not re-

main at the top, but will roll down the incline, and the rods 16 will guide it to its position of rest, thus throwing the switch 10 back to the position shown in full lines in Fig. 1.

5 This travel of the ball up and down the incline is independent of the motion of the vehicle after the first impulse has been given to the ball, and therefore it serves to open and close the switch independently of the subsequent movement of the vehicle. In order to

10 impart this impulse to the ball or other movable object, we have provided means operated by the movement of the vehicle when it reaches a certain point. In the embodiment shown

15 this consists of a head 18, pivoted at 20, and a lever 19, connected thereto. A spring-stop 19^a keeps the head 18 normally just out of contact with the ball. 17 is a buffer carried by head 18. 19 is a projection in the form of a lever in

20 the path of movement of the trolley-wheel 2. This lever 19 is also pivoted at 20 and has a part rounded at 21 and square at 22 to engage a shoulder on 18, so that when the vehicle is moving in the direction of the arrow

25 in Fig. 1 the trolley-wheel will move the lever 19 and head 18 into the position shown in dotted lines in Fig. 1; but when the trolley-wheel moves in the opposite direction it will push aside lever 19 without moving head 18.

30 23 is a spring to resist the drawing back of head 18. When the trolley-wheel moves forward from its position in Fig. 1, it will release lever 19 and allow head 18 to spring forward. As it strikes stop 19^a the inertia of

35 head 18 will bend the stop slightly forward and head 18 will strike the ball a quick blow and impel it up the incline, allowing the switch to close. The ball will then run back and reopen the switch. The switch is thus opened

40 and closed automatically and entirely independently of the movement of the vehicle. We have also provided means to vary at will the interval between the throwing and returning of the switch. In this embodiment

45 the rods 16 are attached to heads 25 26. Head 25 is pivoted at 27 to standard 28. Threaded leg 29 and nut 30 constitute a means for adjusting the incline of the track, and therefore for varying the interval between the start of

50 the ball and its coming again to rest, and consequently the interval between the opening and closing of the switch.

We are aware that our invention may be used by itself and not in connection with a

55 vehicle, if desired, and we therefore do not desire to limit ourselves to its use in connection with a vehicle.

We are aware that many changes may be made in the embodiment herein shown and

60 described without departing from the spirit of our invention, and we therefore do not desire to limit ourselves to the particular embodiment herein disclosed.

We claim—

65 1. In an electric apparatus in combination, a switch-arm normally separated from its co-operating terminals, a movable device adapt-

ed to rest in one position, automatic means to strike said movable device a quick blow and move the same to a distance, thereby re-

70 leasing said switch-arm and causing the same to complete the circuit, and means to cause said movable device to automatically return to its former position and reopen said circuit.

2. In an electrical apparatus in combina-

75 tion, a switch, means to automatically throw the same when released, a movable device adapted to rest in one position, automatic means to strike said movable device a quick blow and move the same to a distance thereby

80 releasing said switch and causing the same to be thrown, and means to cause said movable device to automatically return to its former position and throw back said switch.

3. In an electrical apparatus in combina-

85 tion, a switch adapted to be automatically thrown when released, a rolling device adapted to rest in one position and hold said switch from being thrown, an inclined track for said device sloping upward from said position of

90 rest, automatic means to strike said rolling device a quick blow and impel the same to a distance up said inclined track thereby releasing said switch and causing the same to be thrown, said inclined track being adapted

95 to cause said device to automatically roll down to its former position and throw back said switch.

4. In an electrical apparatus in combination, a normally open electric circuit, a signal

100 controlled thereby, a switch adapted to automatically close said circuit when released, an inclined track, a rolling device adapted to rest at the bottom of said track, means projecting from said switch into the path of movement of said rolling device at its point

of rest whereby said device normally holds said switch open, a spring-actuated head and a lever connected therewith, said head being adapted to strike said rolling device and im-

110 pel the same to a distance up said track thereby releasing said switch and closing said circuit, said track being adapted to cause said device to automatically return after an interval to its former position and reopen said

115 switch.

5. In an electrical device in combination, an inclined track, a rolling device adapted to travel up the same by the momentum impart-

120 ed to it and downward by gravity and come to rest at a point on said track, a switch having a part projecting into the path of movement of said device whereby said switch is held from being thrown, means to impart an impulse to said device to cause the same to

125 travel up said track and release said projecting part and cause said switch to be thrown, said device being adapted to then roll down said track and strike said projecting part and throw said switch back to its former position.

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6. In an electrical device in combination, an inclined track, a ball adapted to travel up the same by a momentum imparted to it, and down by gravity, and come to rest at a point

on said track, an automatically-thrown switch having a part projecting into the path of movement of said ball at said point of rest whereby said rolling device holds said switch
5 from being thrown, a spring-pressed lever adapted to be drawn back against the force of said spring and released, a part moved by said lever, said part being adapted to strike and impart an impulse to said ball to cause
10 the same to travel up said track and release said switch, said ball being adapted to then roll down said track and move said switch back to its former position.

7. In an electrical apparatus in combination, an inclined track, a device automatically
15 movable up and down thereon, means to impart an impulse to said device, a switch separate from said device, and a connection between the same and said device whereby said
20 switch is automatically thrown and returned on the movement of said device.

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