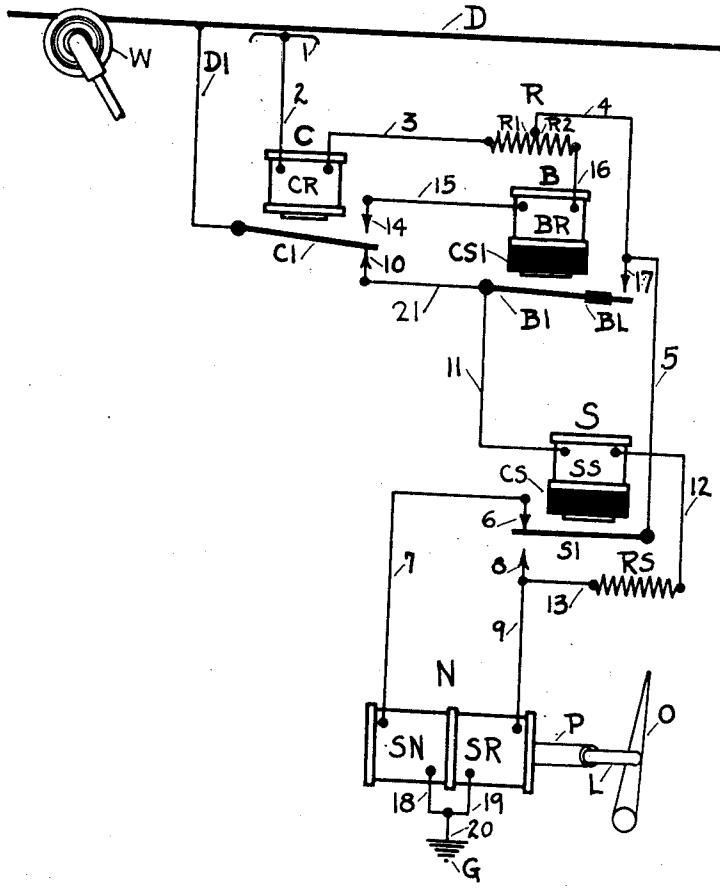
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SPEED SELECTIVE CONTROL SYSTEM

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SPEED SELECTIVE CONTROL SYSTEM

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This invention relates to electrical control systems, and has particular application to automatic electro-magnetic setting of switch points on electric railways to different positions dependent upon the speed at which a railway car approaches the switch point.

One object of this invention is to produce a system which will effect an operation of the switch tongue to one position when a car approaches the switch point at a speed less than a predetermined rate, and which will operate the switch tongue to another position when the car approaches the switch point at a speed greater than the predetermined rate.

Another object of this invention is to produce a system which will provide a definite period of current application for operating the switch tongue.

A still further object of this invention is to produce a system in which the speed of the car is to be effective only while engaging the circuit closing device or trolley contactor.

A still further object of my invention is to provide a system which will direct current to the mechanism to be actuated, only after the car disengages the circuit closing device governing the selective operation of the mechanism.

Other objects and advantages will be apparent as the description of my invention is made herein.

As heretofore constructed, the conventional form of electrically operated switch point control systems have depended upon the well known principle of "power on" or "power off" to the motors of the vehicle for selecting the desired position of the switch point. While this method of control has been extensively employed, there are certain operating conditions which render it impracticable. For instance, with the increasing current consumption of auxiliaries in electric railway vehicles, the margin between the auxiliary currents and motor operating currents has become extremely narrow. In fact, in some instances the auxiliary currents practically equal the motor currents. Likewise, the application of electrically operated switches on steep grades have proven impractical when controlled by the principle of "power on" or "power off". It is extremely difficult for an operator of a vehicle to shut off the power to the motors of a vehicle and coast "up-hill" for switch selection. Similarly the vehicle in attempting to use motor current "down-hill" for switch selection, will encounter difficulties through regeneration of the vehicle motors.

These objects are attained by the apparatus illustrated in the accompanying drawing, in which—

The figure illustrates an embodiment of the invention as applied to the control of switch points at conventional turn out locations.

With reference to the drawing the character O designates a switch tongue which is electromagnetically operated by the solenoids SN and SR. The reciprocating plunger P operating within the solenoids SN and SR mechanically connects the switch tongue O through link L. Although the switch tongue O is illustrated in the reverse position, it must be understood that it may be illustrated normally in either of its operable positions.

The character D designates a current conductor or over-head trolley wire. Positioned adjacent conductor D is flexible contact member 1 which is arranged to be engaged by a current collector W of a vehicle.

The relay C employed in the invention is provided with an operating coil CR and an armature C1 operating between contacts 14 and 16.

The relay B employed in the invention is provided with an operating coil BR and an armature B1 for engaging contact 17 located within a magnetic blowout, symbolically represented by BL. The relay B is of the slow release type, and is provided with a means symbolically represented by CS1 for retarding the release of its armature B1 upon deenergization of its operating coil BR. It is well known to those familiar with the art that many methods can be employed to retard the release of an armature, such as an oil or air dash-pot arrangement, a copper or brass sleeve about the core of the relay, a mechanical inertia device or a combination of same.

The relay S that I employ is likewise a slow release relay, and is provided with an operating coil SS and an armature S1 operating between contacts 6 and 8. The relay S is provided with a means symbolically represented by CS for retarding the release of its armature S1. It is apparent that this device may be of the same nature as employed on relay B.

Resistance units R and RS may be of any of the conventional forms employed in electrically controlled apparatus for limiting the amount of current in a circuit.

With further reference to the drawing, it will be noted that as soon as the current collector W engages the flexible contact member 1 adjacent the trolley wire D, a circuit will be completed for energizing operating coil CR of relay C.

This circuit being completed from the current conductor D, through the current collector W, through the contact member 1, through wire 2, operating coil CR of relay C, wire 3, resistance unit R1, wire 4, wire 5, armature S1 of relay S, front contact 6 of relay S, wire 7, solenoid SN of track switch N, wire 18, wire 20, to ground G. It must be remembered that the current flowing in this circuit will be sufficient to energize the operating coil CR of relay C to affect its armature C1, but will not be sufficient to energize the solenoid SN of track switch N to an extent where the switch tongue O will be operated. As soon as armature C1 of relay C engages its front contact 14 a circuit will be completed for energizing the operating coil BR of relay B. This circuit being completed from the current conductor D, through wire D1, armature C1 of relay C, front contact 14 of relay C, wire 15, coil BR of relay B, wire 16, resistance unit R2, wire 4, wire 5, armature S1 of relay S, front contact 6, wire 7, solenoid SN of track switch N, wire 18, wire 20 to ground G. It must be further remembered that the current flowing through the circuit just described will not be sufficient to energize solenoid SN of track switch N. Similarly the total current of each of the latter circuits described and flowing to the track switch N will not be sufficient to energize the solenoid SN. When the armature C1 of relay C was brought into engagement with its front contact 14, it was brought out of engagement with its back contact 10. This operation resulted in deenergizing the operating coil SS of relay S, since the circuit for normally energizing the operating coil SS is normally completed through the engagement of armature C1 and its back contact 10. This circuit normally being completed from the current conductor D, through wire D1, armature C1 of relay C, back contact 10, wire 21, wire 11, operating coil SS of relay S, wire 12, resistance unit RS, wire 13, wire 9, solenoid SR of track switch N, wire 19, wire 20 to ground G. It must be remembered that the current normally flowing in the circuit just described will sufficiently energize the operating coil SS of relay S to retain the armature S1 in contact engagement with its front contact 6, but will not be sufficient to energize solenoid SR of track switch N. As long as the current collector W engages the contact member 1, the operating coil CR of relay C will be energized and retain its armature C1 out of engagement with its back contact 10 and in engagement with its front contact 14.

It will be apparent that as long as the armature C1 remains in this operated position, the operating coil SS of relay S will remain de-energized thereby permitting its armature to release under the influence of the retarded release device CS. It will be further apparent that if the current collector W engages the contact member 1 for a relatively long period, the operating coil SS of relay S will remain deenergized sufficient to permit its armature S1 to disengage its front contact 6 and come into engagement with its back contact 8. Should the current collector W engage the contact member 1 for a comparatively short time, however, it will be apparent that the armature S1 will not have sufficient time to disengage its front contact 6, and will therefore remain in its actuated position.

As soon as the current collector W disengages the contact member 1, the operating coil CR of relay C will become deenergized thereby permitting its armature C1 to instantly disengage its front contact 14 and to come into contact engagement with its back contact 10. This operation of the armature C1 will likewise result in the deenergization of operating coil BR of relay B thereby permitting the armature B1 to release under the action of the retarding device CS1. As long as armature C1 remains in engagement with back contact 10, and the armature B1 engages its front contact 17, a circuit will be established through wire 5 to armature S1 of relay S for directing switch operating current to either of the solenoids SN or SR of track switch N. As previously described, when the current collector W engages the contact member 1 for a sufficiently long period, the armature S1 of relay S will be permitted to come into contact engagement with its contact 8, thereby directing current to the solenoid SR. This circuit being completed from the current conductor D, through wire D1, armature C1 of relay C, back contact 10, wire 21, armature B1 of relay B, front contact 17, wire 5, armature S1 of relay S, back contact 8, wire 9, solenoid SR of track switch N, wire 19, wire 20, to ground G. As long as switch operating current flows in the circuit just described, the operating coil SS of relay S will not be permitted to become energized, since the flow of current in its circuit will be shunted. This operation will be obvious upon considering that the circuit of the operating coil SS obtains its ground connection through solenoid SR and that as long as switch operating current flows through wire 9 the potential of the current conductor D will be maintained on wire 13. If the current collector W had engaged the contact member 1 for a comparatively short period wherein the armature S1 was not permitted to release its front contact 6, switch operating current will be directed to the solenoid SN. It will be apparant that this circuit will be established from the current conductor D, through wire D1, armature C1 of relay C, back contact 10 of relay C, wire 21, armature B1 of relay B, front contact 17, wire 5, armature S1 of relay S, front contact 6, wire 7, solenoid SN of track switch N, wire 18, wire 20 to ground G. As heretofore mentioned, as soon as collector W disengaged the contact member 1 the operating coil BR of relay B became deenergized, thereby permitting its armature B1 to release under the retarded action of the time element device CS1. Therefore, after a predetermined time period the armature B1 will disengage its front contact 17 and discontinue the flow of current to either of the track switch solenoids SN or SR. As soon as the flow of switch operating current is discontinued the selective relay S will be permitted to restore to its normal position.

It will be obvious to those familiar with the art that when the current collector W is required to engage the contact member 1 for a long period, the speed of the vehicle must be reduced below a given rate, while, when the current collector W is required to engage the contact member for a relatively shorter time period, the speed of the car must be increased over a given rate.

While the system shown in the figure was described as being applied to the control of a switch point located at a point where cars may continue is a straight line or be directed to the curved position by operation of the switch tongue O, there are conditions where a series of such controls are installed on a steep grade for restricting the speed of a car to less than a predetermined rate for the full length of the grade. In this application of

the device, should the speed of the car become greater than desired for the movement downhill, the switch point will automatically be thrown to the curved position and derail or redirect the travel of the car before serious accidents could occur. In this system there are a number of switch points and controls located comparatively close.

While the foregoing description and figure illustrate this invention as applied to the control of an electrically operated track switch, the invention has been employed to selectively control signals. Modifications of this invention as applied to the control of signal systems are numerous and have not been included since it is believed that it will be apparent to those familiar with the art that this invention has application to many forms of signaling systems. Therefore, this invention is not to be restricted to the specific arrangements and modifications of the parts and circuits shown in the accompanying drawing and disclosed in the specification, since it is evident that other modifications and arrangements may be made and fall within the scope of this invention and claims.

I claim:

1. In a track switch operating system comprising, a trolley contactor having a contact member to be engaged by a current collector, a trolley conductor, a track switch, electrically controlled operating means for the said track switch, a branched operating circuit leading to the track switch operating means, a selective switch normally conecting the operating circuit to one of the branched circuits and selectively operated to select the other of said branched circuits to permit operation of the track switch in one direction or the other, electrical operating means to control the said selective switch, a circuit breaker switch in the operating circuit normally maintaining the circuit open, electrically operating means to close the said circuit breaker switch, another switch normally connecting the electrically operating means of the selective switch and the said circuit breaker switch to the trolley conductor, and means responsive to the engagement of the current collector with the said contact member to operate the said another switch, to alter the circuits normally connected thereto, and connect the said electrically operating means of the said circuit breaker switch to the trolley conductor.

2. A system according to claim 1 wherein the said circuit breaker switch is provided with a time element device to retain the said circuit breaker switch closed for a predetermined time after the said another switch is restored to normal.

3. A system according to claim 1 wherein the electrically operating means of the said selective switch is normally energized and de-energized by the operation of the said another switch to cause the selective switch to select the other of said branch circuits, and means permitting operation of the selective switch only when the said another switch is operated for a predetermined time.

4. In a track switch operating system comprising, a trolley contactor to be engaged by a current collector, a trolley conductor, a track switch, electrically controlled operating means for the said track switch, a branched operating circuit leading to the track switch operating means, a selective switch for selectively connecting the operating circuit to one or the other of the branch circuits to permit operation of the track switch in one direction or the other, normally energized electrical operating means to control the said selective switch, a normally inactive time switch in the operating circuit normally maintaining the circuit open, normally de-energized electrically operating means to close the said time switch, another switch normally connecting the electrically operating means of the said selective switch and the said time switch to the trolley conductor, normally inactive means responsive to the engagement of the current collector with the said trolley contactor to operate the said another switch to alter the circuits normally connected thereto and to connect the electrically operating means of the time switch to the trolley conductor, and means responsive to the altered condition of the said circuits, to withhold energization of the said electrically controlled operating means of the track switch until the said another switch is restored to normal.

5. A system according to claim 4 wherein means are provided to retain the selectively actuated position of the selective switch when the said another switch is restored to normal and until the said operating circuit is disconnected from the trolley conductor.

6. A system according to claim 4 wherein means are provided to cause the said time switch to retain the operating circuit closed for a predetermined time after the collector disengages the contact element.

7. In a track switch operating system comprising, a trolley contactor having a contact member to be engaged by a current collector, a source of power, a track switch, electrically controlled operating means for the said track switch, a branched operating circuit leading to the track switch operating means, a selective switch for selectively connecting the operating circuit to one or the other of the branch circuits to permit operation of the track switch in one direction or the other, a circuit breaker switch in the operating circuit normally maintaining the circuit open, electrically operating means to close the said circuit breaker switch, another switch normally connecting the said circuit breaker switch to a source of power, and means responsive to the engagement of the current collector with the said contact member to operate the said another switch to open the circuit normally connecting the said circuit breaker switch and to connect the electrically operating means of the said circuit breaker switch to a source of power, and electrically operated means responsive to an operation of the said another switch to affect the said selective switch only when the said another switch is operated for a predetermined time.

8. In a track switch operating system comprising, a trolley contactor having a contact member to be engaged by a current collector, a source of power, a track switch, electrically controlled operating means for the said track switch, an operating circuit for directing current to the said track switch operating means, a time switch normally disconnecting the operating circuit from the said track switch operating means, a second switch in the operating circuit to normally maintain the said operating circuit disconnected from the source of power, electrically operated means to close the said second switch, another switch normally connecting the said second switch to the source of power, and means responsive to the engagement of the current collector with the said contact member to operate the said another

switch to open the circuit normally connecting the said second switch and to connect the said electrical operating means of the said second switch to the source of power, and electrically operated means responsive to the operation of the said another switch to affect the said time switch to close the said operating circuit to the track switch operating means only when the said another switch is operated for a predetermined time.

9. In a track switch operating system comprising, a trolley contactor having a contact member to be engaged by a current collector, a source of power, a track switch, electrically controlled operating means for the said track switch, an operating circuit leading to the said track switch operating means, a time switch for selectively opening the operating circuit leading to the said electrically controlled operating means, a second switch in the operating circuit to normally maintain the circuit disconnected from the source of power, electrically operating means to close the said second switch, another switch normally connecting the said second switch to a source of power, and means responsive to the engagement of the current collector with the said contact member to operate the said another switch to open the circuit normally connecting the second switch and to connect the said electrically operated means of the said second switch to the source of power, and electrically operated means responsive to the operation of the said another switch to affect the said time switch to open the said operating circuit leading to the switch operating means only when the said another switch is operated for a predetermined time.

10. In a track switch operating system comprising, a trolley contactor to be engaged by a current collector, a source of power, a track switch, electrically controlled operating means for the said track switch, a branched operating circuit leading to the track switch operating means, a selective switch for selectively connecting the operating circuit to one or other of the said branched circuits to permit operation of the track switch in one direction or the other, operating means for the said selective switch, another switch normally connecting the operating means of the said selective switch to the source of power, and means responsive to the engagement of the current collector with the said trolley contactor to operate the said another switch to disconnect the operating means of the selective switch from the source of power, and means associated with the said selective switch to permit operation thereof only when the said another switch is operated for a predetermined time.

11. In a track switch operating system comprising, a trolley contactor to be engaged by a current collector, a source of power, a track switch, electrically controlled operating means for the said track switch, a branched operating circuit leading to the track switch operating means, a selective switch operable to two positions for selectively connecting the operating circuit to one or other of the said branched circuits to permit operation of the track switch in one direction or the other, operating means for the said selective switch, another switch normally connecting the operating means of the said selective switch to the source of power to retain the selective switch normally in one position, means responsive to the engagement of the current collector with the said trolley contactor, to cause the said another switch to operate and disconnect the operating means of the selective switch from the source of power, and means associated with the said selective switch permitting operation of the selective switch to its other position only when the said another switch is operated for a predetermined time, and means responsive to the operation of the said another switch to connect the said operating circuit to the source of power for a predetermined time after the said another switch is restored to a normal condition.

12. A system according to claim 11 wherein means are provided to retain the operating means of the selective switch de-energized as long as current flows in the switch operating circuit and only when the said another switch has been operated for the said predetermined time before the switch operating circuit was closed.

13. A system according to claim 11 wherein means are provided to retain the selective switch in its normal condition as long as current flows in the switch operating circuit and only when the said another switch has been operated for a period less than the said predetermined time before the switch operating circuit was closed.

14. In a track switch operating system comprising, a trolley contactor to be engaged by a current collector, a source of power, a track switch, electrically controlled operating means for the said track switch, a branched operating circuit leading to the track switch operating means, a selective switch operable to two positions for selectively connecting the operating circuit to one or other of the said branched circuits to permit operation of the track switch in one direction or the other, operating means for the said selective switch, another switch normally connecting the operating means of the said selective switch to the source of power to retain the selective switch normally in one position, and means responsive to the engagement of the current collector with the said trolley contactor to cause the said another switch to operate and disconnect the operating means of the selective switch from the source of power, means associated with the said selective switch permitting operation of the selective switch to its other position only when the said another switch is operated for a predetermined time, and means responsive to the operation of the said another switch to connect the said operating circuit to the source of power for a predetermined time after the said another switch is restored to a normal condition, and means to prevent operation of the said another switch as long as current flows in the said branched operating circuit.

15. In a switch operating system comprising, a trolley contactor to be engaged by a current collector, a source of power, a track switch, electrically controlled operating means for the said track switch, a branched operating circuit leading to the track switch operating means, a time element switch for selectively connecting the operating circuit to one or other of said branched circuits to permit operation of the track switch in one direction or the other, a circuit breaker switch in the operating circuit normally maintaining the circuit open, operating means for the said circuit breaker switch responsive to the engagement of the current collector with the trolley contactor to close the said operating circuit, the said time switch responsive to affect the said branched circuit only when the collector engages the contact member for a predetermined time, and means permitting the said circuit breaker switch to establish a flow of current for a prede-

termined time in the said operating circuit only upon disengagement of the current collector and trolley contactor.

16. In a selectively operated relay system comprising a trolley contactor having a contact member to be engaged by a current collector, a source of power, mechanism to be selectively operated, electrically controlled operating means for the said mechanism, a branched circuit leading to the said operating means, a selective switch for selectively connecting the operating circuit to one or the other of said branched circuits to permit selective operation of the said mechanism, a circuit controlling switch in the operating circuit normally maintaining the circuit open, electrically operated means to close the said switch, another switch normally connecting the circuit controlling switch to a source of power, and means responsive to the engagement of a current collector with the said contact member to operate the said another switch, to open the circuit normally connecting the said circuit controlling switch and to connect the said electrically operated means of the last mentioned switch to the source of power.

17. In a selectively operated relay system comprising a trolley contactor having a contact member to be engaged by a current collector, a source of power, mechanism to be selectively operated, electrically controlled operating means for the said mechanism, a branched circuit leading to the said operating means, a selective switch for selectively connecting the operating circuit to one or the other of said branched circuits to permit selective operation of the said mechanism, a circuit controlling switch in the operating circuit normally maintaining the circuit open, electrically operated means to close the said circuit controlling switch, another switch normally connecting the circuit controlling switch to a source of power, and means responsive to the engagement of a current collector with the said contact member to cause the said another switch to operate and open the circuit normally connecting the said circuit controlling switch and to connect the electrically operated means of the said circuit controlling switch to the source of power, and electrically operated means responsive to the operation of the said another switch to affect the said selective switch only when the said another switch is operated for a predetermined time.

18. A system according to claim 17 wherein means are provided to maintain the said circuit controlling switch operated for a predetermined time after the said another switch is restored to normal.

19. In a selectively operated control system comprising, a trolley contactor having a contact member to be electrically engaged by a current collector, a source of power, a mechanism to be selectively operated, electrically controlled operating means for the said mechanism, a branched circuit leading to the said operating means, a time element switch for selectively connecting the said circuit to one or other of the said branched circuits to permit operation of the said mechanism, electrically operated means to control the said time element switch, means responsive to the electrical engagement of the current collector with the said contact member to affect the operating means of the said time switch only when the collector maintains continuous electrical engagement with the said contact member for a predetermined time, and other means responsive to the electrical engagement of the current collector with the said contact member to establish a flow of current in the said branched circuit upon disengagement of the current collector and contact member.

20. A system according to claim 19 wherein the flow of current in the said branched circuit is discontinued a predetermined time after the collector disengages the said contact member.

21. In a track switch operating system comprising, a trolley contactor having a contact member to be engaged by a current collector, a source of power, a track switch, electrically controlled operating means for the said track switch, an operating circuit for directing current to the said track switch operating means, a time switch normally disconnecting the operating circuit from a source of power, normally energized operating means for the said time switch, means controlled by contact engagement of the current collector and contact member to de-energize the last mentioned operating means to cause operation of the said time switch to establish a flow of current in the said operating circuit only when the current collector engages the contact member for a predetermined time.

22. In a track switch operating system comprising, a trolley contactor having a contact member to be engaged by a current collector, a source of power, a track switch, electrically controlled operating means for the said track switch, an operating circuit for directing current to the said track switch operating means, a time switch normally disconnecting the operating circuit from a source of power, normally energized operating means for the said time switch, means controlled by contact engagement of the current collector and contact member to de-energize the last mentioned operating means to cause operation of the said time switch to establish a flow of current in the said operating circuit only when the current collector engages the contact member for a predetermined time, and means for discontinuing the flow of current in the said operating circuit after a predetermined time.

23. In a switch point operating system, the combination of a switch point, an actuating solenoid, a relay for selectively directing currents through different parts of said solenoid, a current conductor, a current collector, a contact positioned adjacent the said current conductor to be electrically engaged by the said current collector, said relay normally in one condition of operation for directing current through one part of said solenoid and actuated during the electrical engagement of the current collector with the said contact to another condition of operation for directing current through a different part of said solenoid dependent upon whether the said collector maintains continuous electrical engagement with the said contact for a predetermined time or not.

24. In a switch point operating system, the combination of a switch point, a double solenoid operating means for the switch point to operate it in one direction or the other, a current conductor, a current collector, a contact positioned adjacent said current conductor to be electrically engaged by the said current collector, means operable to selectively direct currents through different parts of the said actuating solenoid, said means normally in one condition of operation for directing current through one part of said solenoid, and means responsive to the electrical engagement of the current collector with the said

contact to cause the first mentioned means to operate to another condition of operation during the engagement of said collector and said contact for directing current through a different part of said solenoid dependent upon whether the collector maintains continuous electrical engagement with the said contact for a predetermined time or not.

25. In a selectively operated relay system comprising a source of power, a mechanism to be selectively operated, electrically controlled operating means for the said mechanism, a relay switch for selectively directing currents through different parts of said electrically controlled operating means, a normally energized operating coil therefor, said relay switch normally in one condition of operation for directing current through one part of said electrically controlled operating means and operating a predetermined time after the deenergization of the said operating coil to a different condition of operation for directing current through another part of said electrically controlled operating means dependent upon whether the said operating coil is deenergized for the said predetermined time or not.

26. In a switch point operating system, the combination of a switch point, an actuating solenoid, a relay switch for selectively directing currents through different parts of said solenoid, a normally energized operating coil therefor, said relay switch normally in condition for directing current through one part of said solenoid and operating a predetermined time after the deenergization of the said operating coil for directing current through a different part of said solenoid dependent upon whether the said operating coil is continuously deenergized for the said predetermined time or not.

27. In a switch point operating system, the combination of a switch point, an actuating solenoid, a relay switch operable to selectively direct currents through different parts of the said actuating solenoid, an operating coil therefor, said relay switch normally in condition for directing current through one part of said solenoid and operating a predetermined time after the deenergization of said operating coil for directing current through a different part of said solenoid dependent upon whether the said operating coil is continuously deenergized for the said predetermined time or not, and means for establishing a flow of current through the part of the solenoid selected for a predetermined time.

28. In a selectively operated relay system comprising, a trolley contactor having a contact member to be electrically engaged by a current collector, a source of power, a mechanism to be selectively operated, electrically controlled operating means for the said mechanism, a branched circuit leading to the said operating means, a time element switch for selectively connecting the said circuit to one or other of the said branched circuits to permit operation of the said mechanism, electrically operated means to control the said time element switch, and means responsive to the electrical engagement of the current collector with the said contact member to cause the operating means of the said time switch to effect selection of said circuits during a predetermined time after said engagement and dependent upon whether the current collector maintains continuous electrical engagement with the said contact member for the said predetermined time or not.

29. In a selectively operated relay system comprising, a device adapted to be operated to one position by a vehicle only while said vehicle is passing over a particular portion of its path of travel, a mechanism to be selectively operated, electrically controlled operating means for the said mechanism, a branched circuit leading to the said operating means, a time element switch for selectively connecting the said circuit to one or other of the said branched circuits to permit selective operation of the said mechanism, electrically operated means to control the said time element switch, and means responsive to an operation of said vehicle operated device to cause the operating means of the said time switch to effect selection of said circuits during a predetermined time after the operation of said vehicle operated device and dependent upon whether the said vehicle operated device is maintained continuously operated for the said predetermined time or not.

30. In a selectively operated control system comprising, a device adapted to be operated to one position by a vehicle only while the said vehicle is passing over a particular portion of its path of travel, a source of power, a mechanism to be selectively operated, electrically controlled operating means for the said mechanism, a branched circuit leading to the said operating means, a time element switch for selectively connecting the said circuit to one or other of the branched circuits to permit selective operation of the said mechanism, electrically operated means to control the said time element switch, means responsive to an operation of said vehicle operated device to affect the operating means of the said time element switch dependent upon whether the said vehicle operated device is maintained continuously operated for a predetermined time or not, and other means responsive to the operation of said vehicle operated device to establish a flow of current in the said branched circuit.

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