

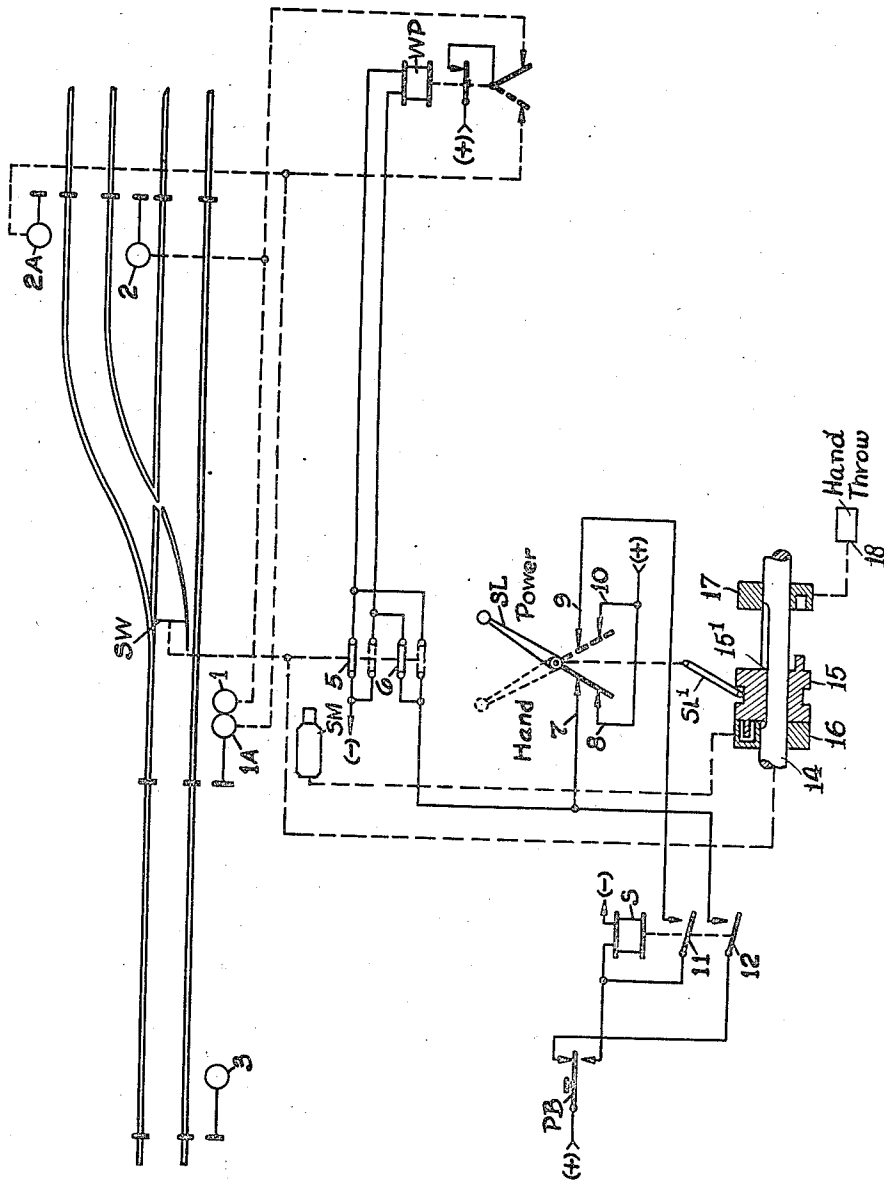
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SIGNALING SYSTEM FOR RAILROADS

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SIGNALING SYSTEM FOR RAILROADS

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This invention relates to signaling systems for railroads, and more particularly to the control of signals associated with track switches arranged to be operated either by power or by hand.

In certain applications of power-operated track switches, it is desirable to provide means by which the switch can be readily disconnected from the power operating means and moved and locked by a manipulation of a hand-throw device; and switch machines are sometimes equipped with a means, commonly known as a dual control selector, which permits the operating gearing of the switch machine to be disconnected from the operating motor and coupled to a hand-throw lever, so that for switching moves, or in the event of failure of the power means, the switch can be operated and locked by hand.

When such a dual control selector is employed with a power-operated switch, it is desirable to break the circuits for clearing the signals governing traffic over the switch when the selector lever is in the hand-throw position, so that as long as the switch is being operated by hand for switching movement, the signals cannot clear. Among other things, this affords signal protection for the train doing the switching; and even if the signals are manually controlled by an operator at a central control point, and would not ordinarily clear when the switch has been thrown and locked, the same control of the signals is desirable in order that there may be no divided responsibility between the operator and the trainman operating the switch by hand.

Under some conditions, however, it is also desirable that the signals be allowed to clear when safe to do so, even though the switch is in condition to be operated by hand. For example, there may be some failure or other condition which prevents operation of the switch by power; and to avoid train delays, it is expedient to permit the switch to be moved and locked in the desired position by hand, and allow trains to pass over the switch under the protection of the signals.

With these considerations in mind, in accordance with this invention, it is proposed to provide in connection with a switch machine equipped with a dual control selector device so that the switch points may be operated and locked by hand, another manually operable device, which would be manipulated as occasion may require, and preferably only under the instructions of the operator, to permit the signals to clear while the switch is in condition to be operated by hand.

The accompanying drawing illustrates in a simplified and diagrammatic manner the principles and functions of the invention, the parts and circuits being shown more with a view of facilitating an understanding of the invention, rather than with the idea of showing the structural organization of the switch machine, signals, and associated parts, which are well-known in the art, and may take various forms.

Referring to the drawing, a track switch SW, with associated signals 1, 1A, 2, and 2A for governing traffic over the switch, is illustrated conventionally. The track switch SW is assumed to be connected to a power-operated switch machine, diagrammatically shown as SM, equipped with the usual point detector contacts, and a dual control device. A switch machine of the type contemplated is disclosed, for example, in the patent to W. K. Howe, No. 1,466,903, September 4, 1923.

The power operation of this switch machine SM is assumed to be controlled in some suitable manner (not shown) by an operator at a distant point, either by direct line wire control, or through the agency of a code type communication system, in accordance with the principles and practices in interlocking and centralized traffic control systems.

This switch machine SM is provided with suitable point detector contacts, such as disclosed, for example, in the patent to R. C. Leake, No. 1,442,685, January 16, 1923, which are closed in accordance with the position and locked condition of the switch points. Such contacts are illustrated conventionally as comprising two movable contact members 5 and 6, which are operated from the position shown to an intermediate position when the switch points are unlocked, and to the other extreme dotted line positions when the switch points are over and locked in the other position. These contacts are interconnected in the well-known manner to act as pole-changing contacts to control the energization of a relay WP, which in turn controls the circuits for the signals governing traffic over the switch in accordance with the common practice, as indicated conventionally by dotted lines. It is assumed that the clearing of the signals, subject to control by track circuits and the energized condition of the relay WP, is under the control of the distant operator in a suitable manner not shown.

The switch machine SM is also provided with a suitable dual control device, including a selector lever, illustrated diagrammatically as SL, which may be operated to connect the point

throwing and locking mechanism of the switch machine either to the motor, or to a hand-throw lever, so that the switch points may be moved and locked either by power or by hand operation.

5 A dual control device of this type is disclosed, for example, in the patent to W. C. McWhirter, No. 1,716,787, June 11, 1929. The selector lever SL actuates contacts shown diagrammatically when in the positions for power and hand operation.

10 As diagrammatically shown, a switch throw rod actuating shaft 14, carries a coupling member 15 splined thereto, as at 15¹, the coupling member 15 being slidable by lever SL¹, connected to, and movable with, selector lever SL, to operatively
15 connect it either to the member 16 power operated by the switch machine SM, or to the hand operated member 17, operated by a hand throw device 18.

In accordance with this invention, an additional
20 manual control device is provided. As illustrated, this device is in the form of a push-button or suitable hand switch PB and a stick relay S. The push button PB is located near the switch at a point conveniently accessible to a trainman, and
25 is preferably enclosed in a locked or sealed box.

Under ordinary conditions, with the selector lever in the power position shown, the switch machine is in condition to be operated by power and the relay WP is controlled by the point detector
30 contacts 5—6, the supply of current to these contacts from one terminal of the battery or other source, indicated by (+), being through contacts 7 and 8 closed with the selector lever SL in the power position. The switch machine may be
35 controlled by the operator, and the signals may clear dependent upon the position and locked condition of the switch as manifested by the energization of the relay WP.

Assuming now that a train desires to do switching over the switch in question. The trainman,
40 acting under instructions from the operator, moves the selector lever SL from the power position shown to the other dotted line position, opening contacts 7—8 in so doing. This brakes the
45 supply of energizing current for the relay WP, and the circuits for clearing the signals are broken at the same time the switch machine is put in condition for hand-throw operation. The trainman may throw and lock the switch points
50 as required, and direct the switching operations by hand signals.

During such switching operations, all of the signals 1, 1A, 2 and 2A governing traffic over the
55 switch are held at stop, and consequently, all the signals, such as the signal 3, governing traffic toward the switch, indicate caution and warn any approaching train to slow down and stop, even though the track circuits controlling the stop indications for such approach signals do not happen
60 to be occupied at the particular time. In this way, adequate signal protection is provided for the train making the switching moves, even though the operator should thoughtlessly or accidentally attempt to clear any of these signals.

65 Assume now that for some reason, due to failure of power, breakage of parts, or the like, the switch machine cannot be operated by power. Under such circumstances, the switch must be thrown by hand. To do this, the trainman moves the
70 selector SL to the hand-throw position the same as when making a switching move; and when this is done, contacts 7—8 are open so that the signals governing traffic over the switch cannot clear.

Such failure of power operation of the switch
75 machine, however, may be such that the switch

points can be moved by hand and properly locked; and to avoid unnecessary stopping of trains making movements over the switch in its existing position, it is desirable that the signals be permitted to clear. In such a case, the trainman, acting
5 under the instructions of the operator, pushes the push-button PB to pick up the stick relay S through a pick-up circuit readily traced on the drawing, and then releases the button. With the selector lever in the hand-throw position, the stick
10 relay S is stuck up by a stick circuit through the contacts 9 and 10 and its own front contact 11; and when the push-button PB is released and returns to its normal position, current is supplied to the point detector contacts 5 and 6 to energize the
15 relay WP through the push-button PB and front contact 12 of the stick relay S. If the switch points are over and locked, the relay WP is energized, and this permits clearing of the signals.

The switch may be left in this condition so long
20 as the failure of power operation exists; and trains making movements over the switch in its existing position may do so without stopping, while other trains may stop and operate the switch by hand as required. In this way, the movement of traffic
25 is materially facilitated in the event of power failure or the like.

When the power has been restored, or repairs made, so that the switch machine can be operated by power, selector lever SL is placed in the power
30 position. This opens the contacts 9 and 10, and breaks the stick circuit for the relay S, restoring the parts to the normal condition.

This invention provides for controlling the signals governing traffic over a switch in a way
35 which takes care of train movements under normal operation of the switch by power, switching moves under hand-throw operation of the switch, and also train movements under special or emergency conditions of failure of power operation.
40 One characteristic feature of the invention is the use of two separate manually operable devices, one the usual selector lever by which the switch machine is placed in condition for power operation or hand-operation, and the other the push button
45 PB and stick relay S, or equivalent means, which may be also operated when occasion requires, to permit clearing of the signals with the switch machine on hand-throw.

The specific embodiment of the invention shown
50 and described is merely illustrative; and various adaptations and modifications may be made without departing from the invention.

What I claim is:—

1. In a signaling system for railroads, a track
55 switch, a switch machine, dual control means conditioning the switch to be moved and locked by power or by hand, signals governing traffic over the switch, and manually operable means at the switch operable for clearing of the signals while
60 said switch machine is in condition for hand operation due to the position of the dual control means.

2. In a system of signaling for governing train movements over track switches, the combination
65 with power means for operating the switch, a hand-throw device for moving and locking the switch, a selector lever for rendering either the power means or the hand-throw device effective, and signals governing traffic over the switch; of
70 manually operable means separate from the said selector lever for clearing the signals when said selector lever is in the hand-throw position.

3. In a system of the character described, the combination with a track switch, power means
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for operating the switch, a hand-throw device for moving and locking the switch, signals governing traffic over the switch, circuits for controlling said signals governed in accordance with the position and locked condition of the switch, a selector lever for optionally connecting the switch to said power means or said hand-throw device, said lever when in the hand-throw position breaking said signal control circuits, of other manual means for controlling of said signal control circuits while said selector lever is in the hand-throw position.

4. In a system of signaling of the character described, a track switch, contacts operated in accordance with the position and locked condition of the switch, a switch machine including power means and a hand-throw device for moving and locking the switch, a selector lever for rendering either the power means or the hand-throw device effective, signals governing traffic over the switch and having circuits controlled by said contacts, means operated by the movement of the selector lever to the hand-throw position for breaking said signal circuits, a stick relay acting when energized to supply current to said signal circuits independently of the position of the selector lever, a manually operable circuit controller for energizing said stick relay, and a stick circuit for said stick relay closed only while the selector lever is in the hand-throw position.

5. In a signaling system for railroads, a track switch, a switch machine, dual control means for conditioning the switch to be moved and locked by power or by hand, signals governing traffic over the switch, said control means, when in hand position, putting the signals to stop, and manually operable means at the switch operable to allow clearing of the signals at the option of the trainman while said switch machine is in condition for hand operation due to the position of the dual control means, provided the switch is in locked condition.

6. In a system of signaling of the character described, a track switch, contacts operated in accordance with the position and locked condition of the switch, a switch machine including power means and a hand-throw device for moving and

locking the switch, a selector lever for rendering either the power means or the hand-throw device effective, signals governing traffic over the switch and having circuits controlled by said contacts, means operated by the movement of the selector lever to the hand-throw position for breaking said signal circuits, a stick relay, a manually operable controller movable from normal to operated position to energize the stick relay, a stick circuit for the stick relay closed only while the selector lever is in the hand-throw position, and a circuit for supplying energy to said signal circuits requiring the stick relay to be energized and the controller in its normal position.

7. In a system of signaling of the character described, a track switch, contacts operated in accordance with the position and locked condition of the switch, a switch machine including power means and a hand-throw device for moving and locking the switch, a selector lever for rendering either the power means or the hand-throw device effective, signals governing traffic over the switch and having circuits controlled by said contacts, means operated by the movement of the selector lever to the hand-throw position for breaking said signal circuits, means, including a manually operable controller movable from a normal to an operated position, requiring movement of the controller to its operated position and then back to its normal position, for clearing the signals when the selector lever is in the hand-throw position.

8. In a system of signaling for governing train movements over track switches, the combination with power means for operating the switch, a hand-throw device for moving and locking the switch, a selector lever for rendering either the power means or the hand-throw device effective, and signals governing traffic over the switch; of means, including a manually operable controller movable from a normal to an operated position, requiring movement of the controller to its operated position and then back to its normal position, for clearing the signals when the selector lever is in the hand-throw position.

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