

What's the Answer?

Slotting Relay

What is a signal slotting relay and where is it used? Please give a description including its operation.

Origin Traced

By V. O. SMELTZER

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The term "signal slotting relay" is not used in Santa Fe signal terminology. However, it is interesting to speculate on the origin of such a designation for a signal relay. The Association of American Railroads defines a slot as "A disconnecting device inserted in the connection between a signal arm and its operating mechanism." In the 1911 edition of the Signal Dictionary compiled for the Railway Signal Association, we find the same definition with the following explanation: "In its original English form the 'slot' consists of rods having cut in them long slots. The slot is used to put a signal in the stop position, regardless of the action or inaction of the signalman in charge of such signal. With the slot arrangement a given signal can be put in the stop position by either of two signalmen, but it cannot be put in the clear position except by the cooperation of both signalmen."

As the art of signaling progressed, the electric slot was introduced, and we find again in the Signal Dictionary: "A device in which the connection between a signal arm and its operating mechanism is controlled by an electromagnet, the connection being broken when the magnet is de-energized and established when the parts are in proper mechanical relation and the magnet energized. Commonly used in semi-automatic block signaling to prevent the clearing of a signal, or to cause it to assume the stop position when the route or track section, the use of which by trains is governed by the signal, is obstructed. In telephone train dispatching it is used to prevent the clearing of the signal without the consent and cooperation of the dispatcher."

The electric slot has been used in the connecting rod between the interlocking lever and the signal arm of mechanical signals to cause

the signal to assume the stop position when a track section ahead of the signal was occupied. The magnet of the electric slot was controlled through the track relay so as to be energized only when the track was unoccupied. With the ad-

Can You Answer These

1—Do you have a program in effect on your railroad for keeping vegetation out of line wires and, if so please outline. If no program, please state how you minimize excessive "escape" from bare line wires?

2—What method or means is used to check that the point detector opens the contacts when the rail gaps $\frac{1}{4}$ in. on handthrow or power switch movements?

3—In retarder yards where you use power-operated switches which are self-restoring after being obstructed or trailed through, do you provide a color-light switch-position indicator (switch target) on the ground at the switch? Please explain why you do or do not use these indicators.

4—What means are being taken in automatic classification yards to improve shunting characteristics? Please explain.

5—What type of indicator is used in slow speed territory to signify to approaching enginemen that highway crossing gates are in the lowered position prior to the engine's movement over the crossing? What are the advantages of using such an indicator?

6—Have you found a fast and satisfactory method of duplicating telegraph messages other than by hectograph ribbon and gelatine roll duplicating processes? Please explain.

7—Where a switch is located, say 100 ft. or less from and in approach to an automatic signal, would you select the control circuit of that signal through the switch? Please explain the advantages or disadvantages of this practice. What other solution would you have for this situation?

8—What method should be followed in mixing and pouring concrete during freezing weather? Please explain fully.

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vent of the electric semaphore signal the electric slot became familiar to signalmen as the connection between the electric motor and the semaphore arm.

Since the slot is used to put a signal to stop or to prevent its clearing, it serves a similar purpose to the signal control relay. Therefore, the H signal control relay might easily be termed the "signal slotting relay." In some cases the control relay may be a track relay, or it could be a line relay controlled through a series of track circuits. In the latter case its operation would be similar to any neutral or polarized signal relay.

Track Circuit Control

By H. D. BROOKS

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A signal slotting relay, named after the "slotting" coil of the old mechanical semaphore signal is used for the same purpose in the modern light signal, namely, to give it track circuit control and cause the signal to display a stop or red aspect while a train occupies any track circuit within its control limits.

It is used mostly in NX or UR type pushbutton interlockings, being placed in the control of the home signal "H" relay to give track circuit (slotting) to the "high" signal without slotting the call-on signal whose control is common with that of the "high" signal.

Interlocking Signals

By H. B. GARRETT

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It appears that there is no real technical definition for a "signal slotting relay"; however, in referring to the 1911 signal dictionary, the definition of an electric slot reads as follows: "A device in which the connection between the signal arm and its operating mechanism is controlled by an electromagnet, the connection being broken when the magnet is de-energized and established when the parts are in proper mechanical relationship and the magnet energized." The electric slot was com-

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What's the Answer? Cont'd.

monly used in semi-automatic block signals to prevent the clearing of a signal or to cause it to assume the stop position when the route or track section, the use of which by trains was governed by the signal, was obstructed.

Modern-day use of a signal slotting relay is, I believe, confined to the control of interlocking signals through track circuit or circuits where such signals were not controlled through track circuits in early-day signaling, especially if the interlocking was in terminal territory or what might be called a switching yard interlocker. Again referring to the 1911 signal dictionary, we find that the definition of a slotted signal is: "A signal in which the connection from the lever or other operating mechanism is controlled by a mechanical or electric slot."

Fall Maintenance

For communication maintenance, what special work do you schedule for autumn, preparatory to the winter season, to prevent trouble during the cold weather?

Patrol Pole Lines

By A. E. DEMATTEI

Superintendent of Communications
Southern Pacific
San Francisco, Calif.

We do not schedule any special work, however, we do require that all lines be patrolled very carefully by maintenance personnel in order that all possible preventative maintenance may be performed prior to winter season. This preventative maintenance work consists of replacing broken insulators, loose crossarm braces, retying line wires to insulators wherever necessary, tightening slack guy wires, etc.

Pole Line Work

By ALLEN H. FOX

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For outside plant the maintainers are given instructions to cover their district thoroughly, performing what work, as to straightening poles, tightening guys, replacing insulators and ties, they can handle themselves. Where the work is heavy, a crew will be put on the

job to do preventative work. District supervisors cover their territory to determine what should be done, and line up the maintainer and/or crews on work to be performed. Ground work is done first, with top work taking second choice, since the latter can be performed after freeze-up.

For inside facilities no special arrangements are made, just the usual periodic inspections and day-to-day maintenance.

No Fall Program

By N. W. MENZIES

Superintendent of Communications
Western Pacific
San Francisco, Calif.

In the operation of the Western Pacific Communication Department we have no "fall program". We have a continual maintenance program in force the year round, so as to preclude the necessity of any special seasonal program. This holds good for our outside plant and also for the inside plant with the exception that we do give a complete check and line-up just prior to winter weather on all of our carrier telephone and telegraph circuits. As far as our radio maintenance is concerned, this is done on a monthly schedule and does not vary with the seasons.

Signal Maintenance

For signal maintenance, what special work do you schedule for autumn, preparatory to the winter season, to prevent trouble during the cold weather?

Seven Major Items

By A. L. JORDAN

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Baltimore & Ohio
Baltimore, Md.

The following items should be inspected and repaired if necessary before cold weather arrives: (1) Bootlegs should be free from ballast and track circuit connectors securely fastened. (2) Lock rods in switch machines should be clear and properly adjusted. (3) Switch circuit controllers should be inspected and ballast cleaned from operating rods. (4) Drainage should be provided at all switches. (5) Switch heaters should be inspected

and made ready for use. (6) Wire entrances should be sealed and ventilators should be cleaned. (7) Air lines should be blown out, and alcohol drips filled and regulated.

Clean-Oil-Check

By M. R. ROBERTS

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Some of the more important items of maintenance scheduled for the late autumn months are: Clean and lubricate switch machines, circuit controllers, electric locks and semaphore signals; clean commutators of switch machines and semaphore signals; check and replace gaskets where necessary; clean and oil contacts with a good grade of light oil; check contact tension and replace worn contacts on the above equipment. Also, make frequent inspection of adjustments of switch machines, switch circuit controllers and electric locks during the months while extreme temperature changes are occurring.

Storage batteries are checked to determine if they are fully charged, connections clean and tight, and are filled with distilled water to the proper level. Pole line is checked, and all broken insulators, loose or broken tie-wires are replaced; and storm guys are tightened where necessary on signal department pole lines.

Preventive Measures

By J. W. GAVEY

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Good signal maintenance requires that considerable effort be devoted to preventive measures. Weather conditions encountered and seasonal average will dictate the sequence in which the following items of preventative maintenance will be accomplished.

(1) Track circuits; Careful inspection and replacement of defective bonds, bootleg connections and other track leads. Particular attention must be given shunt foulings and switch circuit controller connections. Check insulated joints for damaged fiber.

(2) Switch circuit controllers, switch machines, spring switch buffers, etc.: Lubricate all exposed bearings to preclude entrance of water. See that adequate drainage