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COMMUTATORS

"What is the best way you have found to clean the commutators of electric motors in switch machines, signal or crossing-gate mechanisms?"

Gas and Fine Sand Paper

By W. ABELL
Signal Engineer
Canadian Pacific, Winnipeg, Man.

IF a commutator is fouled with gummy film, this can be removed with a lint-free cloth saturated in gasoline, which will evaporate quickly, leaving no residue to collect further foreign matter later. After removal of the gummy film, the commutator, if roughened, should be smoothed down with extra fine sand paper which is a non-conductor and will not shed any dust that could give trouble. When commutators become dirty in service, it is generally due to external causes, as when brushes of the proper composition are used and kept clean, the commutator should develop a high degree of polish and function without the necessity of cleaning indefinitely.

Brushes that contain too high a percentage of graphite will sometimes cause a dirty commutator but, more often, it is the presence of oil or grease on the contact surface of the brushes that underlies the trouble. When brushes become saturated with oil, they should be replaced and the cause of such saturation eliminated; otherwise, persistent fouling of the commutator will result, and repeated cleaning will not effect a cure. Adequate brush tension should be maintained to offset the possibility of arcing, which will roughen the commutator and aggravate the difficulty.

O.K. Cleaner and Defroster

By B. J. SCHWENDT
Assistant Signal Engineer
New York Central System
Cincinnati, Ohio

THE best method we have found for keeping electric motor commutators clean and, incidentally, keeping frost off of them, is by the use of O.K. Cleaner and Defroster. This material is furnished by the A. & H. Corporation in Chicago.

Five Steps

By JOHN O'CONNOR
Signal Maintainer
Chicago, Miwaukee, St. Paul & Pacific
Madison, Wis.

FOLLOWING are five steps for cleaning electric motor commutators in signal, crossing-gate mechanisms and switch machines:

(1) Clean commutators with a clean linen cloth free from lint.

(2) Clean with crocus cloth. This is a very fine grade of emery cloth which is used also to grind certain kinds of valves.

(3) Raise each brush with the finger and clean the bottom of it with the crocus cloth.

(4) Exercise care when oiling, and do not over oil electric motors. Wipe off all surplus oil, and commutators will remain clean longer.

(5) Be sure to operate motor after cleaning and oiling is completed.

SPRING SWITCH SIGNALING

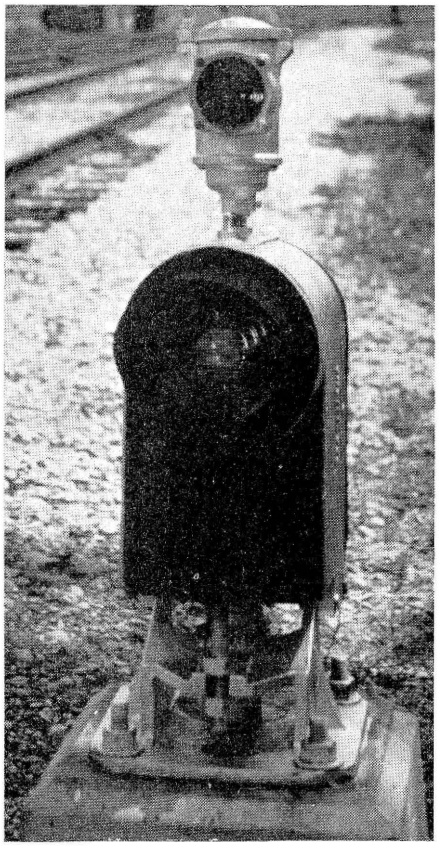
"What special signal arrangement and aspects do you install at spring switches equipped with facing-point locks, to provide protection in case the lock plunger is in 'overthrow?' Please furnish sketch if practicable."

Lunar White Lamp

By B. F. McGOWAN
Superintendent of Signals
Minneapolis, St. Paul & Sault Ste. Marie
Minneapolis, Minn.

ON our latest spring switch installations at the ends of passing tracks in single-track automatic block signal territory, each such switch is equipped with an automatic mechanical facing-point lock which locks the switch points in the normal position. When a train starts to move from the siding to the main track, the lock is automatically unlocked.

There is a small lamp unit with a 3-in. lunar white optical lens, which is mounted on top of the leave-siding dwarf signal at each spring switch location, as shown in the accompanying picture. This lamp is normally lighted to indicate that the plunger in the facing-point lock is not in overlock. On the other hand, the lamp is extinguished if the plunger extends too far through the rod and the dwarf signal is displaying a red aspect. Thus, the lunar white lamp must be lighted, in addition to the display of a green or yellow aspect by the dwarf, to constitute a proceed indication for a trailing-point train movement through the switch without stopping. If the lamp is out, our rules require a train on the siding to stop short of the switch, and the switch to be thrown by hand.



Small lamp unit on top of leave-siding dwarf indicates that the plunger in the facing-point lock is not in overthrow

Two-Aspect Electric Switch Lamp

By W. G. SALMONSON
Assistant Chief Engineer-Signals
Pennsylvania, Philadelphia, Pa.

OUR practice is to provide an electric switch lamp at the spring switch, displaying indications in both directions. A green indication is displayed when the switch is locked in its normal position and a

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red indication is displayed when the switch is unlocked, or when the lock plunger is overdriven.

Position-light distant switch signals or color-light distant switch indicators are provided for facing and trailing movements where the speed exceeds 20 m.p.h. for such movements. If the switch is locked in its normal position, a Clear distant signal (Rule 281 green indication) on the distant switch indicator is displayed. If the locking plunger is withdrawn, or is in the overdrive position, a Caution distant signal, the indication of which requires a train to approach the switch prepared to stop, or a yellow indication on the distant switch indicator, is displayed.

Small Red Light

By E. B. DeMERITT
Signal Engineer
Central of Georgia, Macon, Ga.

WHERE the spring switch is equipped with a facing-point lock, we have a small red lamp located near the fouling point of the switch which is lighted only when the lock is overlocked. When that occurs, we see no reason to slow up train movements, other than those to trail through the switch—that, we want to prevent. Thus, on trailing train movements from a siding to the main line, or at the end of two or more tracks, when the trailing lamp is lighted, it indicates that the switch must be thrown by hand and, after the movement has been made, the switch must be restored by hand to its proper position, locked, and the points examined in the same manner as a hand-operated switch.

For facing-point moves, there is usually a signal approximately 50 ft. ahead of the switch points. No light is necessary to indicate the position of the switch, as the signal gives its most restrictive indication if the switch point is not closed and locked. When a train is stopped at the signal, the switch points must be examined by a member of the train crew before proceeding at restrictive speed. At locations where a low yellow light is used to indicate what is sometimes called a "tonnage" or "grade" signal, to allow a train to proceed at restrictive speed without making a stop, this low yellow light is not illuminated unless the points of the spring switch are closed and locked. At the few locations where there is not an automatic signal within 100 ft. governing facing point moves over the spring switches, we have a main-line facing-point spring switch light, which consists of two light units mounted horizontally—red to the left and green to the right—to indicate whether or not the switch points are up and locked. When a train is stopped at a Stop-and-Proceed signal, a member of the crew must examine the switch point if the red light is displayed or no light displayed, but need not do so if the green light unit is displayed.

INTERLOCKING PLANT HORNS

"At towers and outlying points in interlockings, what is the most effective type of horn, you have found, for calling maintainers or for other signaling purposes—air, straight electric, etc.? What is your practice with reference to the location, installation and control of, and power supply for such horns?"

Air Type Most Effective

By E. T. GARRISON
Supervisor of Signals
Chesapeake & Ohio, Richmond, Va.

THE most effective type horn is air operated. Horns or other type audible signals have to be selected for each particular location, depending on the distance you desire the sound to carry, and other noises that must be overcome. The sound should be distinctive, i.e., different from other whistles or horns that might prove confusing.

We overcame several difficulties at one outside location on our railroad, by the use of a duplex air horn, which had a very distinctive sound and could be heard for one mile. This particular horn was operated by 75-lb. air pressure, actuated by push-button control, which operated a 110-volt a.c. electro-pneumatic valve magnet. This horn was in constant competition with the audible signals of engines, ships, automobiles and sirens, and filled every expectation.

Straight electric horns, I could not recommend for outside use, unless it was out at some remote point, void of other noises and then, not to be heard too far away. This type horn is all right for inside use, such as in storerooms and shops. Where air is available, the most reasonable installation is the air whistle, which can be hand operated by direct chain-to-valve, or remotely controlled from a push button, with either low-voltage d.c. or 110 volts a.c.. actuating an electro-pneumatic valve magnet.

Where air is not available and distance for sound travel is desired, the most effective horns are those with self-contained compressors, which are operated by push-button or relay control at outlying points, and which can be obtained for use with either low-voltage d.c. circuits or 110 volts a.c. Horns should be installed with shields over them to protect against becoming clogged with snow, sleet, etc., and the action of mud-carrying wasps.

C.T.C. CODE LINES

"Where a C.T.C. control office is to be located so that the code line must be in aerial or underground cable for a considerable distance—a mile or more, for example—what problems are involved, and what are the solutions from an engineering standpoint?"

Depends Whether Carrier Is On Line

By E. W. HORNING
Assistant Engineer C.T.C.
Chicago & North Western
Chicago

FOR the physical or direct d.c. code line, cable presents no special problem, except that which is found in any straight d.c. circuit. The use of superimposed carrier frequencies over a pair of line wires, a portion of which is in cable, involves a study to determine the necessity of one or more carrier repeater units, which may be required to provide input to the carrier receiver at the converter location.

Factors, such as size of wire over which the carrier will be operated, ohmic unbalance, results of a transmission-line test and local conditions, such as proximity of other carrier circuits, power lines, etc., should be considered. The manufacturer who would furnish the carrier equipment should be consulted to determine what is required to enable them to provide an efficient and reliable carrier system.