Therefore, where the lighting load exceeds these values the sun-relay point is used to control an auxiliary relay capable of carrying heavy loads either inductive or non-inductive as the case may be.

If the signal lamps are normally energized from an a-c. line the sun relay can be used either at each individual signal location or at the feed end of the a-c. line to switch the lamps to a lower transformer tap at dusk or when it starts to get dark. In the morning, provided the light intensity reaches a predetermined degree, the sun relay will again switch the lights to the higher tap. On dark days the lights will be dimmed. Since the light intensity may be different at various points along any right-of-way some engineers favor the use of a sun relay at each individual signal location.

Where the lamps are operated from direct current the sun relay can be used to shunt a resistance unit placed in series with the lamps during daylight—the shunt across the unit being automatically opened when it becomes dark. Of course, the sun relay should be mounted where it will be exposed to a maximum amount of light.

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Inspecting Switch Circuit Controllers

"On main-line automatic-block signal territory, how frequently should switch circuit controllers, connections, and the circuits affected, be tested and inspected?"

Number of Inspections Depends on Traffic

D. W. Fuller

Assistant Signal Engineer, Atchison, Topeka & Santa Fe, Topeka, Kan.

We endeavor to have an inspection made of all switch circuit controllers on rigid switches twice monthly, while on spring switches an inspection is to be made weekly. It is very important that fouling shunt wires should be given close inspection, and we endeavor to have these tested twice monthly.

The frequency of inspection of switch boxes and fouling jumpers, of course, depends largely on track conditions, and traffic, there being no question but that more frequent inspections are required on some sections of line than on others.

Where rail is well anchored, switch boxes will hold their adjustment better than where it is not, and for that reason the conditions change due to temperature variations, which would have a bearing on the frequency of inspections.

Constant Attention

O. S. Tomkins

General Signal Inspector Chicago & North Western, Chicago

On main line automatic block signal territory, switch circuit controllers, connections and the circuits affected, should be tested and inspected at least every 60 days. The connections and position of the switch points should be given a close visual inspection and checked whenever the signalman passes a switch location. Whenever the signalman is working in the close vicinity he should also watch for any unusual conditions which may have been caused by dragging equipment or by some "ambitious" section foreman spiking in the stock rail without notifying the signalman of his intent. The signalman should also make an operating check of the opening of the points as frequently as possible between the 60 day inspections.

Other answers to this question will be published later.

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Operating Long Switch Points

"What arrangement can be used for operating long switch points so as to be sure that the points do not spring over, leaving the mid-section out of line?"

Second Connection Used on Pennsylvania

When installing new junctions in the vicinity of Cincinnati, Ohio, to make connections to lines extending to the new Union Station, the Pennsylvania installed some long crossovers and turnouts, using switch points 45 ft. long in layouts where 131-lb. rail section is used. These switches are power operated by d-c. low-voltage switch machines which are controlled remotely as a part of a centralized traffic control installation.

Switch layout using second connection

The use of switch points 45 ft. long introduced a new problem. In order to be assured that the points complete their movement throughout their entire length, rather than being sprung over at the point, leaving a part of the length out of proper alinement, a special pipe connection was devised. This one-inch pipe connection extends from the operating rod at the points through cranks to a second operating rod attached to the switch 22.5 ft. from the points. The first crank is so drilled as to obtain a 4-in. movement of the pipe line. Adjustments are made at the second switch adjuster to co-ordinate the operation at the two locations and to secure the correct amount of throw of the points at the mid-section.

This arrangement throws the entire length of the switch points as a unit, without springing the points out of line. The position of the switch at the point is, of course, checked by the point detector which is a part of the switch machine. In order to check the position of the mid-section of the switch points, an extra switch circuit controller, including contacts in the SS control circuit, is connected to a switch foot attached to the right-hand point 22.5 ft. from the point.

Adjustable rail braces are used on the first four ties under the points and on every other tie throughout at least 25 ft. of the length of the switch points so that the stock rails can be maintained in proper position. These installations, including the 45-ft. switch points, have been in service since April, 1933, and the arrangement has proved entirely satisfactory.