

arrangement insures that light engines using the crossovers have both track circuits fouled regardless of the position of the hand-throw

switches. If the track centers between the two main lines do not exceed 15 ft., this arrangement amply serves.

Broken Rails

"In case a maintainer is called on signal trouble in automatic block signal territory and a broken rail is discovered, what action is required on the part of the maintainer in regard to placing flags, fuses and/or lanterns? Where are the flags, fuses and lanterns placed?"

Signals Places at Stop

E. G. STRADLING
Supt. Tel. & Sig., Monon,
Lafayette, Ind.

When a signal maintainer is called out on account of signal trouble, he receives information from the dispatcher as to the location of all approaching trains. Should the signal maintainer discover that a broken rail is the cause of the signal trouble, he takes steps to protect any closely approaching train. After such train has been stopped, or permitted to pass, and there is no other closely approaching train, the signal maintainer disconnects the track relay, thereby causing all signals affected to assume, or to remain in, the stop position to protect other trains. The signal maintainer then goes after the section men to make repairs or replace the rail. After a new rail has been put in place and bonded, the maintainer connects the track relay, permitting the signals to assume their normal position. He then makes a report by telegraph to the dispatcher and also mails a written report to the signal supervisor.

Telephone Test Set Utilized

E. T. GARRISON
Supervisor Signals, Chesapeake & Ohio,
Clifton Forge, Va.

The maintainers, upon being called, are required to obtain a written "line-up" of the location of all trains before leaving their headquarters, to ascertain the cause of a case of trouble. When a broken rail is discovered, the first thing the maintainer does is to disconnect the control wire at the relay of the track circuit involved. This is according to instructions covering rail laying or for any other reason that track is broken.

With his "line-up" of trains, the maintainer knows both the train and the time to expect that train, and if there is a sufficient amount of time before the next train is due at that

point, he communicates with an operator or the train dispatcher (with the aid of a telephone test set, Western Electric No. 1017-B, which he carries) and informs them of the break and its location. The dispatcher in turn will advise train crews by message of the broken rail, its location, and to expect a flag at that point.

Should there not be sufficient time to call the dispatcher prior to the expected arrival of a train, the maintainer will place a red flag or lantern at the break and go back with torpedoes and fuses to allow for braking distance, and will inform the engine crew of how the break looks. The maintainer will remain at the break, protecting traffic as outlined above, until the track crew arrives and the break is repaired.

Section Man Accompanies Maintainer

A. C. JOHNSON
Signal Maintainer, Union Pacific,
Grand Island, Neb.

Our method of handling broken rails in block signal territory is as follows:

When a signal maintainer is called outside of regular hours for signal trouble, other than lights out, he is required to take a section man with him. In addition to his regular tools, he is required to take a claw bar, spike maul, adz, and a pair of angle bars. If the failure is occasioned by a broken rail, they proceed to make the track safe for slow speed by placing the bars at the break and spiking them in place.

The maintainer then returns to notify the section foreman, while the section man protects the broken rail. At the point of obstruction, or at the broken rail, he places a red flag in day time or a red light at night between the rails, and places torpedoes in both directions. One-half mile from the point of obstruction he places one torpedo on the rail on the engineman's side, continuing back to

a point $\frac{3}{4}$ mile from the point of obstruction, he places two torpedoes on the rail on the engineman's side, two rail lengths apart. Then continuing back to a point one mile from the point of obstruction, he places two additional torpedoes on the rail on the engineman's side, two rail lengths apart. After placing torpedoes in both directions, against the current of traffic first, he returns to the point of obstruction, where he remains, except that if a train approaches he will proceed towards it and flag it with hand signals. At night, or in fog or stormy weather, he must display a red fusee in addition. The train may then proceed over the break at slow speed.

Upon the return of the maintainer with the section forces, a flagman is sent in both directions to the single torpedo, where they remain until relieved by another flagman, or recalled verbally by the foreman, or by a note over the signature of the foreman.

Before changing the rail, the signal must be placed in its most restrictive position, by disconnecting the operating circuit.

Standard Code Rules Apply

E. E. BRADLEY
Signal & Telephone Engineer, Western
Maryland, Hagerstown, Md.

All our maintainers are qualified men on rules and road, and if a broken rail is discovered, protection is required in accordance with standard code rules, which require a sufficient distance to insure full protection.

Height of Light Signals

"At what height should a light signal be mounted above the level of the top of the rail, so as to be as nearly as possible in line with the engineman in a modern heavy-duty passenger or freight locomotive? What other factors must be considered in determining the height for mounting such signals?"

Practice on the Southern

W. J. ECK
Assistant to Vice-President, Southern,
Washington, D. C.

We mount these signals so that the center of the lower lens (red) is 14 ft. above the base of the rail and have found this to be a satisfactory mounting height. The height is occasionally varied to prevent obstruction of the view of the signals by the brow of a hill, viaducts, embankments, etc.

(Continued on page 658)