What's the ANSWER?

Unusual Signal Trouble

"What were the circumstances involved in the most unusual signal failure you have encountered, and how did you correct the trouble?"

Temporary Short

E. H. GENTRY
Signalman, D. & R. G. W.,
Glenwood Springs, Colo.

While working as maintainer at an interlocking plant, I was informed in none too gentle words one day that signal 1L had gone red after the operator had cleared it, and that the operator had been able to put the lever normal and clear it a second time by putting the lever to the left. The operator was unable to say if the O. S. light was burning or not.

After testing everything which I thought could possibly have caused the trouble, I was able to find a partial cross on 2TP circuit, repeating 2T, which was the "OS" or stick section. This circuit carried in 37-conductor aerial cable for about 3,000 ft. to a substation and was then in open line to signal 1L-1R. The cable had been shot into with a 22-caliber bullet, the bullet staying in the cable. When a train passed this place in the cable, the vibration of the train caused a temporary short. If signal 1L were lined at the time, the short would put the signal red, where it would stay unless the operator put the lever normal and cleared the signal the second time.

In C.T.C. Territory

J. H. CRAIG
Signalman, Missouri Pacific,
Atchison, Kan.

I had just finished checking all of the signals in a particular absolute block forming part of a C.T.C. system. As I reached the east end of the block, a westbound train entered the block on a clear signal. A pusher engine was at the rear of the train to assist it through the block, which was all on a steep grade. The pusher returned from the opposite end of the block with clear signals, eastbound. The next train was a westbound passenger for which the westward head-block signal displayed a stop indication.

The signal supervisor was on the train, and he, of course, watched the track closely for a broken rail. As the train was nearing the end of the block (after receiving four stop signals and about 25 minutes delay) the engineman of the train and signal supervisor noticed something across the rails at a road crossing and wired me accordingly.

I went immediately to the location they specified and found the track shunted down by a steel band with which some one had tied the rails together. The steel band was the type often used around heavy boxes and cartons. I removed about two feet of the steel band from between the rails and left the remaining part there for evidence.

Too Few Insulated Joints

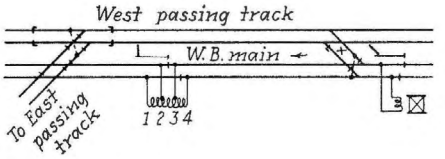
D. GUIGUE
St. Lambert, P. Q., Canada

The most unusual case of "off-and-on" trouble I have had first revealed itself when the approach indicator in the tower started to work up and down one day, while a train was crossing from the east to the west passing track. Sometimes it would not budge during said crossing, sometimes it would drop and stay down, and at other times it would keep playing up and down. It was then found that the distant signal was likewise pumping up and down.

This trouble occurred after the crossover marked X in the sketch had been installed. The crossover had been insulated from the main line by only one joint, as shown, and energy from that part of the track transformer feeding west from the home signal was picked up by a crossing train and transmitted to the west passing track, whence it would flow to the crossover X, through the fouling wire, through the track element of the relay and back to lead 3 of the track transformer. This energy opposed that regularly flowing through the relay, and caused the relay to release. The reason the relay did not drop and stay down was no doubt the varying resistance of the unbonded passing track.

The trouble was overcome simply by putting leads 2 and 3 of the track transformer on the same binding post.

It will be seen from the connections shown that the energy between leads 2 and 3 of the transformer



could not be shunted except by bridging the joint that separates their connection to the track, and it was this energy which, when transmitted to the passing track, caused the trouble in the manner explained. It will also be seen that by making leads 2 and 3 common to both directions of feed, the energy feeding west

To Be Answered in a Later Issue

(1) On single track, when automatic signals are out of order and a head-block signal is indicating "stop," what is the rule for handling a train to proceed by the head-block signal?

(2) What type of form is used on your railroad by maintainers and foremen in charging out material used? What form would you recommend as a suitable standard for all railroads?

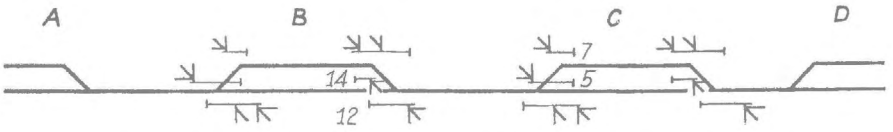
(3) What is the most practicable means of testing the insulation on insulated wires and cables?

Answer to any of the questions above will be paid for in cash or by a subscription to Railway Signaling.

was shunted by a crossing train, and that, therefore, there was none left to be transmitted to the passing track. Peculiarly enough, this failure, which resulted from having installed too few joints, was overcome by bridging an insulated joint. The limiting resistances had to be readjusted according to the changed transformer connections.

Operation by Signal Indication on Single Track

"In a single-track territory, on which train movements are directed by signal indication without train orders, as shown in the sketch, the operator at A controls the switches and signals at siding B, and the operator at D controls the switches and signals at C. An



adequate arrangement of A.P.B. automatic block signaling and circuits is provided between the sidings B and C. With such an arrangement, would you, in addition, provide special check locking or similar circuits in the control of signals No. 5-7 and No. 12-14, which govern movements to the single track between the two sidings C and B?"

Problem Solved by Circuit Changes

J. H. CRAIG
Signalman, Atchison, Kan.

From the sketch and the wording of the question, I take it that the operator at D may clear signal 5 or 7 any time and is entirely independent of the operator at A. Likewise, the operator at A may clear signal 12 or 14 any time without consulting the operator at D. Now with only A. P. B. signaling between signals 12-14 and 5-7, it would be possible to clear signals 5 or 7 and 12 or 14 at the same time. Therefore, trains that are directed by signal indication may each have a clear signal to enter a block against an opposing train. And should each train enter the block at exactly the same instant, each may have a clear or proceed indication. The moment either train enters the block between B and C, the opposing signals are set in stop position.

I would correct this situation by breaking the control relay for signal 12-14 through the back contact of the control relay of signals 5-7. Signals 12-14 now cannot be in proceed indication unless signals 5-7 display their most restrictive aspect. Likewise, the control relay for signals 5-7 should break through the control relay of signals 12-14 in their most restrictive position. Signals 5-7 now cannot display a proceed indication unless signals 12-14 display their most restrictive position. It is impossible now for signals at either end of the block to display a proceed indication unless the signals at the opposite end display a stop indication.

There is also another solution to this problem. Arrange for the operator at D to control signals 12-14 and break the control through signals 5-7 in their most restrictive aspect. Arrange for the operator at A to control signals 5-7 at C, and break the control through signals 12-14 in their most restrictive position.

Check Locking Essential

W. H. STILWELL
Signal Engineer, L. & N.,
Louisville, Ky.

The purpose of signals is to provide, first, safety, and second, facility in train operation.

An adequate system of A. P. B. automatic block signals will normally provide safety, but false proceed indications do occur occasionally as the result of storms or otherwise. If trains are operated by timetable and train orders, there is small chance for a false proceed indication resulting in a collision. If we take away the safeguards of timetable and train orders and operate by signal indications alone, some additional safeguards should be provided in the signal control circuits. Some form of check locking is essential.

In handling trains between stations B and C, there must be cooperation between the operators, in order that superior trains may be given preference. The check lock would compel co-operation, and, from this standpoint alone, it would seem justified. I would, therefore, favor the installation of some form of check locking.

Joint Co-operation Required

L. S. WERTHMULLER
Assistant Engineer, Missouri Pacific,
St. Louis, Mo.

Where train movements are directed in both directions on one track by signal indication without train orders, it is necessary to provide some circuit arrangement other than the typical A.P.B. signal circuit in order to insure the train movements are made in the order desired. This can be accomplished in any number of ways, but in the track and signal arrangement shown in the sketch, the clearing of signals 12, 14, 5 and 7 should require the joint co-operation of the men at both control stations.

While the A.A.R. has no requisites for movement by signal indication other than those covered in requisites for centralized traffic control, the actual operation of trains under either system is the same and the centralized traffic control requisites, in so far as they apply to safety, should be met in any installation of this kind.

Cold Weather Concrete Mixing

"When making concrete foundations, as for example at highway crossing signal installations, during cold weather, what is the most practicable method of preparing the mixture and protecting the foundations to prevent freezing?"

Use Heat

G. E. BECK
Supervisor of Signals, N. Y. C.,
Toledo, Ohio

For winter concrete there is no adequate substitute for heat. The water, sand and stone should be heated. For hand mixing, a piece of iron plate can