EDITORIAL COMMENT

Track Layout for C.T.C.

When considering the installation of centralized traffic control as a means of reducing train delays, one of the items to investigate is the length of the turnouts at junctions and passing tracks. Under time-table and train-order operation, including the use of hand-thrown switch stands, trains must be stopped while trainmen operate the switches. Therefore, either when entering or leaving a passing track the train speed is slow, and as a result the speed restriction necessitated for safe operation over a No. 10 turnout introduces little or no further loss of time. On the other hand, when power switch machines are used as a part of a remote control or centralized traffic control project, it is a decided advantage to have longer turnouts, for example No. 20, thus permitting train speeds up to 40 m.p.h. with safety. Observation of the indication lamps on a c.t.c. track diagram for an installation including No. 10 as well as No. 20 turnouts, shows that the difference in time for a train to enter a siding is quite noticeable.

A freight train of 100 cars with engine and caboose is about 4,100 ft. long. If such a train pulls out of a passing track over a No. 10 turnout at a speed not to exceed 20 m.p.h. for any part of the train, a period of about 4.6 minutes elapses while getting the train onto the main line, as compared with about 2.3 minutes for a similar movement at 40 m.p.h. for any part of the train passing the switch. If the main line running speed is 50 m.p.h., more time is lost in accelerating to this speed from 20 m.p.h. than from 40 m.p.h. and it is estimated that the use of a No. 20 turnout as compared with a No. 10 would save about 2 minutes during this accelerating period. This saving would vary, depending on the type of power, weight of train, grade, etc.

Likewise in preparing to enter a passing siding equipped with a No. 10 turnout, a train traveling at 50 m.p.h. would have to start braking about 6,500 ft. from the switch, in order to reduce speed to 20 m.p.h. at the switch, whereas, in order to reduce to 40 m.p.h. at the switch, the braking need not be started until about 1,500 ft. from the switch. In other words, with the No. 10 turnout, the 6,500 ft. approaching the switch would be traversed in 2.1 minutes, as compared with 1.5 minutes for a No. 20 turnout. Furthermore, with a No. 20 turnout, a train operated at 40 m.p.h. would get into the clear about 2 minutes quicker than a train run at 20 m.p.h. over a No. 10 turnout. This time saving would depend on the length of the siding and space required to bring the train to a stop. If a movement were being made to another running track on which the train were to continue at normal speed, the time saving would be considerably more.

A summary of the discussion given shows that the total time saving for a train movement out of one siding into another would be about 6 minutes, when comparing operation over No. 10 and No. 20 crossovers. These figures are, of course, approximate and would vary depending on local conditions of grade, and on the signal locations and aspects, as well as on the enginemen's handling of the trains.

A saving of 5 or 6 minutes in making a train movement between certain sidings is indeed an important factor, often influencing a control operator to advance a train that would otherwise be delayed 30 minutes or more. Therefore, it is evident that when planning extended remote control or c.t.c. installations, it is well to advocate the use of No. 20 turnouts. By changing from No. 10 to No. 20 turnouts at a few passing tracks as a part of the original project, the advantages will be so apparent that a similar change can be justified at the remaining turnouts which are used most frequently.

Observance of Crossing Signals

When it is advocated that drivers of highway motor vehicles should exercise greater care in observing and obeying highway-railroad grade crossing signals, arguments are advanced by numerous drivers that signals at certain crossings operate for extended periods of time when no train movement over the crossings is imminent, the control track circuits being occupied by trains standing at stations or switching. The signal man's answer to this may be that this type of signal is intended as only a cautionary signal, and that a driver, after stopping and observing that the way is seen to be clear, may proceed. On the other hand, there seems to be an increasing belief that where signals operate unnecessarily for extended periods, the drivers using these crossings are soon prone to disregard the signals, and as a result there is a growing tendency to disregard all such signals wherever encountered.

At many of the locations, which are the worst offenders with respect to false operation of signals, corrective measures can be taken. Where certain trains occupy the track circuit controls when standing at coal chutes, water tanks or passenger stations, several roads have installed special automatic cut-outs and restarts, the effect of which is to reduce materially the unnecessary or false operation of the signals.

At many locations the local track layout and train operation is such that it is impracticable and in some cases impossible to control the signals so that they will operate only when a train is to go over the crossing within 20 seconds. For example, if cars are left on the main line while switching on spur tracks, the application of cut-outs may not be practicable. Under such conditions, one solution is for a member of the train crew or other employee to flag the crossing so as to direct highway vehicles to cross, although the signals may continue to operate. A better arrangement is to provide local control at the crossing so that the employee can cut-in or cut-out the operation of the signals while switching movements are being made. In towns where several crossings are protected by automatic signals, part-time manual control from a central point can be used during the hours of the day when switching movements predominate.

The application of any of these special control arrangements entails considerable expense for installation as well as maintenance. However, it seems advisable that action be taken at once at numerous locations, rather than have criticism grow to the extent that the signals, as such, are in disrepute as effective protection.

OPEN FORUM

This column is published to encourage interchange of ideas on railway signaling subjects. Letters published will be signed with the author's name, unless the author objects. However, in order to encourage open discussion of controversial matters, letters may be signed with pen names at the request of the author. In such instances, the correspondent must supply the editor with his name and address as evidence of good faith. This information will not be disclosed, even on inquiry, unless the correspondent consents.

A Maintenance Suggestion

To the Editor:

Through various experiences of maintaining in the few years I have had in signal work, I wish to offer the following as a suggestion for better maintenance, and in case of a failure, quicker restoration to normal conditions of any switch or other apparatus with dynamic indication, or apparatus depending upon self-generating energy for indicating. Use a volt-ammeter (or an ohm-meter) and take specific data, a continuity check, of all circuits, with levers and other operating devices placed in the indicating position, making sure that all contacts are clean, that the generating device is open at the generating point, and that the readings are taken from that point. For instance, take a General Railway Company all-electric 5a layout for a concrete example. Open the brushes, place the lever on the indicating point, making sure that circuit shifter, indicating relay, and all switch machine contacts are in proper position and clean, and note the resistance of the circuit. Next, open the circuit at the indicating contacts of the switch machine, tower side, and take readings. Then, open the circuit at the indicating relay and take readings. This gives you three specific readings, and three specific locations to check. This takes time, but if you are a maintainer that wants to keep his apparatus in proper condition, and to hold down failure interruptions, what does a few hours of labor mean? Now, when any particular circuit gets into trouble, take your ohm-meter readings with you on your way out to switch the machine location and many a time you will have located the trouble and have it repaired, while you would be thinking of what to look at by the old hit and miss way. This continuity checking scheme can be used on all other circuits that do not maintain a standing current at all times. In fact, I have a resistance reading of all traffic circuits, between cabins on my territory, and know from time to time of anything out of the ordinary, such as high resistance relay contacts or bad splices. Try this once and you will forever keep it up.

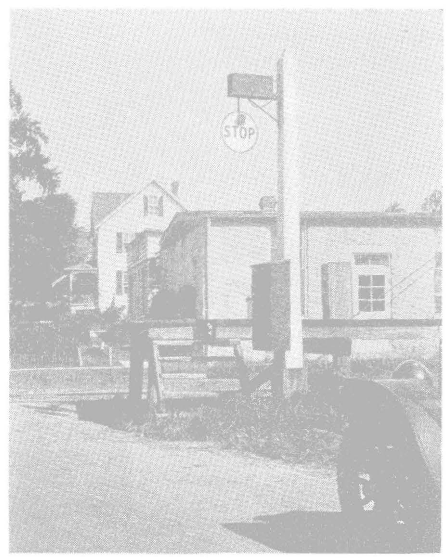
H. C. DUNN,
Huntington, W. Va.

The Rotating Stop-Sign

Baltimore, Md.

To the Editor:

Forty per cent of the highway crossing signals installed by the railroads during the past year were of the type comprising a two-position stop-sign, normally held by electrical energy with its edge to the highway. On the approach of a train, the stop-sign is rotated a quarter of a turn on a vertical axis by gravity, and presents its



Adler rotating-disk signal installed on the Maryland & Pennsylvania at Glenarm, Md. on Feb. 25, 1921

face to the highway. The stop-sign is displayed to vehicular traffic in a stationary position until after the passage of a train. Electrical energy then rotates the sign back to its normal position.

Invented by the writer in August, 1920, and developed and built under the direction of D. W. Richards, signal engineer of the Norfolk & Western, this type of signal was first installed on the Norfolk & Western at Buena Vista, Va., in October, 1920. The signal was described and illustrated in the December 24, 1920, issue of the *Railway Age,* on page 1124 of Vol. 69, No. 26, and in *The Railway Signal Engineer* of December, 1920, on page 533, in the New Devices column.

Similar early installations were made on the Baltimore & Ohio at Bates Road, Terra Cotta, District of Columbia, on November 23, 1921; on the Maryland & Pennsylvania at Glenarm, Md., on February 25, 1921; and on the Norfolk & Western at Shepardstown, W. Va., on February 1, 1922.

These facts are set forth solely as a matter of interest, historically.

CHARLES ADLER, JR.