Editorial Comment

Traffic Type Signals for Protection of Highway-Railroad Crossings

FOR MANY years the railroads, individually and through such associations as the Signal Section, A.A.R., and the National Council on Street and Highway Safety, advocated the standardization of highway-railroad crossing signals throughout the United States and Canada. The standards established by these associations include the wig-wag and the flashing-light, with either an automatically-controlled sign reading illuminated STOP or a reflector button sign reading "Stop on Red Signal." During the last decade, these signals, with or without the signs, have been accepted quite generally. Yet, from time to time, so-called "Stop and Go" traffic-type signals have been installed, for the protection of railroad crossings, contrary to the recommendation of the railroad's signal engineer, in compliance with orders or ordinances from city councils. Faced with the necessity of complying with such an order, a railroad often decides that it is advisable to accept the situation and equip one or two crossings, rather than fight the matter and incur the risk of being forced to install signals at several more crossings in the city. Moreover, under certain conditions, "Stop and Go" traffic signals are said to be better adapted to stop street traffic and thus protect the crossings, than wig-wags or flashing-light signals. Such a condition exists where a railroad crosses a main street on which the street intersections are protected by "Stop and Go" signals, because automobile drivers are trained to observe these signals whether at a street intersection or at a railroad crossing, especially if the signals are under the observation of police.

"Stop and Go" traffic signals, of course, constitute a radical departure from the accepted types of railroad-highway crossing signals outlined above. One of the principal differences is that a "proceed" aspect is presented for street traffic when no train is approaching, whereas the accepted types of signals present only "stop" aspects, leaving it to the drivers of highway vehicles, when no train is approaching, to size up the situation and proceed over the tracks at their own risk. It is said that this feature is not acceptable to street or highway traffic officers, their argument being that, so long as the way is clear, every effort should be made to expedite the movement of vehicles, and a proceed indication should, therefore, be given. While overlooking the problem of supplying the power to light a lamp constantly at an outlying point, they contend that if the railroads depend on track-circuit control and signal devices to direct train movements, they can provide the same reliability in the control of crossing signals, so that the use of a "proceed" aspect should introduce no complications or hazards, from the control standpoint.

Therefore, although little has yet been said about these "Stop and Go" crossing signals, numerous installations have been made. One such signal was installed in DeKalb, Ill., on the Chicago & North Western, in 1926, and several crossings were so equipped in Beaumont, Tex., by the A.T. & S.F. several years ago. Two crossings are thus protected in Boston, Mass., by the Boston & Albany. More recently, the T. & N. O. made extensive installations of "Stop and Go" signals in Beaumont, Tex., and El Paso. For several years the Southern has been installing "red and green" "stop and go" signals for the protection of highway crossings in signal territory, where a-c. power was available. An article in the December issue explained how this idea, of using traffic-type signals for crossing protection, is being used in England.

Whether we like it or not, "stop and go" traffic-type signals are with us, and the problems in connection therewith must be grappled with. Signal engineers, faced with city ordinances or orders to equip certain crossings, have difficulty in convincing city traffic officers of the merits of the Signal Section, A.A.R., flashing-light signals. One way to forestall such difficulties is to install flashing-light signals at one or two crossings as a demonstration, or to invite city traffic officers to inspect installations in service in other cities. The proper handling of a difficult situation in Lakewood, Ohio, and Cleveland, by the Nickel Plate, was explained in an article in the December issue, where 33 consecutive crossings were equipped with flashing-light signals.

Of course, there are instances where city officers insist on the installation of the traffic-type signals for railroad crossings, and a signal engineer's hands are sometimes tied, not only by local circumstances but also by the attitude of his own operating officers. In such cases, he should remember that the Signal Section, A.A.R., Committee on Highway Crossing Protection has given this problem some thought, and last March presented a report, the conclusion of which reads as follows:

> "Stop-and-Go signals should never be used where the signals are operated exclusively by trains. The use of Stop-and-Go signals should be confined to special locations where their observance is enforced by police power."

This conclusion covers many important phases of the problem. As a general rule, crossings equipped

with traffic-type signals are located in cities where there are switching tracks as well as main lines, so that there might be much unnecessary operation of the signals during switching moves. This results in unnecessary delays to street traffic, and leads to disregard of the signals with increased likelihood of accidents. However, it is conceivable that track-circuit control could be used where through main-line train movements predominate, if a release arrangement is provided for control of the signals during infrequent switching movements. However, no variation from compliance with the requirement, "where their observance is enforced by police power," can be tolerated. This stipulation should be included in any ordinance authorizing the installation of traffic-type signals and, incidentally, this should be done with reference to the installation of wig-wag or flashing-light signals, if at all possible. However, merely including the requirement in the ordinance is not enough. After the signals are in service, it is to the railroad's interest to check up on the observance of the signals and to use its influence to insure that police are frequently on hand at the crossings, so as to impress the public. One or two arrests, properly publicized in local newspapers, have a good effect.

Along with these major problems, other details arise. For example, in many cities the "stop-and-go" signals at street intersections are on the "far" corner, and in one instance at El Paso, Tex., when traffic-type signals were proposed for railroad crossing protection, the city officers insisted that the signals be installed on the far side of the tracks. Thus it is evident that this growing tendency to use "stop-and-go" traffic-type signals for highway-railroad crossing protection involves numerous problems to which serious thought should be given by signal engineers and by the Signal Section, in order that situations which arise may be handled most effectively.

Accident Caused by Broken Rail

On October 12, 1934, a derailment of an eastbound passenger train of the Chicago, Rock Island & Pacific resulted in a second accident in which the derailed cars were side-swiped by a westward passenger train traveling on the westward main line. This accident resulted in the death of one passenger and one employee, and in the injury of six passengers and two employees. The following was abstracted from the report of an investigation made by the Interstate Commerce Commission.

The accident occurred on the double-track territory of the Rock Island, 4.5 mi. west of Downey, Iowa, near Iowa City. This line is equipped with three-position upper-quadrant semaphore signals, which are approach lighted. The track is laid with 100-lb. rails fully tie-plated and spiked, with hardwood ties and gravel and stone ballast, all of which are well maintained. The eastward passenger train passed Iowa City, which is 5.6 mi. from the point of the accident at 1:58 a.m. Shortly afterward it encountered a caution signal, which assumed the clear position before the train passed. The next signal was in the stop position. However, it changed to caution and then back to stop. The train stopped at this signal and, after recalling the rear flagman, proceeded into the block under the "stop" indication. After traveling a distance of approximately one mile, at a rate not exceeding 10 m.p.h., the fifth to the eighth cars and various wheels of the second and fourth cars were derailed.

Before adequate flag protection could be established on the westward main line, a westbound passenger train, running at a rate of 35 to 40 m.p.h. collided with the derailed equipment of the first train, which was not sufficiently clear of the track to allow safe passage, even though the second track was not damaged. The speed of the second passenger train had been somewhat reduced as a result of the hasty flagging signals given by the brakeman of the derailed train.

This accident was caused by a broken rail. Examination of the track after the accident disclosed that a rail on the north side had broken into several pieces, all of the fractures being due to the presence of transverse fissures. The largest of these fissures, at the point where the first and second breaks occurred, covered an area of more than half of the head of the rail. According to the evidence, there was no indication of a broken rail or other defect at the time an eastward train passed the point of accident about 1:25 a.m., but from the statements of the engine crew of the derailed train the two automatic signals west of the point of accident were pumping when their train approached, indicating that the rail was broken at the time. The evidence also indicates that the derailed equipment did not damage the westward track and that westward train approaching at high speed, passed the last automatic signal under a clear indication and was too close at the time of derailment to allow the crew of the derailed train sufficient time to provide adequate flag protection.

Wig-Wags Approved for P.W.A. Projects

On December 20, Thos. H. MacDonald, chief of Bureau of Public Roads, United States Department of Agriculture, issued a bulletin explaining the construction of a wig-wag crossing signal, which would be approved for installation with Public Works highway funds, when desired by a railroad and/or a state.

From information in this bulletin, it is to be inferred that the proposed style of wig-wag is to be operated by a mechanism of the magnetic type, and the mounting and backgrounds are to be redesigned so that the signal when in operation will provide essentially the same aspects as a flashing-light signal. The essential features of the design of the new wig-wag signal, "other than standard signs and mounting heights, consists of a wig-wag banner, to be lighted only at the extremes of its swing, and a metal framework encompassing the banner and shield at its extreme positions, thus producing flashing lights spaced 30 in., a balanced outline reasonably in keeping with stationary lights with backgrounds."

Photographs of a typical signal, redesigned to meet the new requirements, accompanied the bulletin. The closing paragraph stated that "The type of signal shown on the attached prints or similar designs of other manufacture embodying all essential features may be approved for installation with Public Works highway funds when desired by a railroad and/ or a state."