

EDITORIAL COMMENT

Non-Stop Permissive Automatic Signals

WHEN discussing proposed means of effecting further reductions in overall time between terminals as well as improving train performance, consideration, in some instances, is being given to the elimination of train stops at permissive automatic signals which are displaying their most restrictive aspect.

On the one hand, it may be argued that, if a permissive signal is displaying its most restrictive aspect, a train should be stopped, not only as a definite check that the engineman acknowledges the possibility of hazard ahead, but also to be assured that the speed of the train is fully under control. On the other hand, some roads argue that the stop required by rule at a permissive signal is of a disciplinary nature, and a hangover from the days before enginemen could be depended on to observe proper respect for rules and regulations. It is contended further that the stops made at these signals can be eliminated with safety, and that by so doing, numerous delays, as well as considerable damage to equipment, can be eliminated. It is argued also that when proceeding in a block, an engineman is required to observe caution and obey the speed regulations, regardless of whether the train was stopped at the signal.

Grade Signals An Entering Wedge

Many roads have recognized the futility of requiring heavy trains to stop at permissive signals located on ascending grades, and have equipped such signals with markers which authorize a train, when encountering a signal displaying its most restrictive aspect, to pass the signal without stopping and proceed in the block with caution. Likewise, in territory where a train, when stopped at a signal, would block one or more heavily-travelled streets or highways, certain roads have equipped the permissive signals with markers which authorize trains to pass without stopping, as explained previously.

On multiple-track lines, where each track is signaled for operation of trains in one direction only, the rule applying to the observance of a permissive automatic signal, requires a train to stop and then proceed with caution. Under double-track operation, there should be no opposing train in the block ahead. However, on single-track it may be a million-to-one chance that two opposing trains would pass opposing headblocks when

displaying proceed aspects. Intermediate permissive signals are, therefore, provided in a staggered arrangement to stop trains in such rare cases. For this reason, the rule on some roads with reference to permissive automatic signals requires that a train stopped by a permissive automatic signal must be preceded by flag protection.

However, there seems to be no necessity for both trains to be preceded by flag protection, and, therefore, where grades are involved, permissive signals can be equipped with grade markers, providing, of course, no two opposing signals are so equipped. Where heavy ascending grades in both directions are involved, a practice used on the Rock Island makes it practicable to use grade markers on opposing signals. In this arrangement, the grade marker is equipped with a lamp unit, which is lighted in connection with the red aspect of the main signal, but only when the train ahead is moving in the same direction as the train which is approaching the signal involved.

When the use of grade markers was first instituted, the rule regarding the elimination of the train stop applied only to freight trains handling more than a certain percentage of the maximum tonnage rating of the locomotive, but during more recent years, delays to important passenger trains have been of increasing importance. Out of seven roads which answered a question on this subject in the November issue of *Railway Signaling*, five (the Union Pacific, the Southern, the Louisville & Nashville, the Missouri Pacific, and the Southern Pacific) replied that they apply this rule to passenger as well as freight trains.

Extensive Experience on Some Roads

With numerous roads permitting the elimination of the train stop at permissive signals on ascending grades, the question may arise as to why some road does not demonstrate the practicability of eliminating the train stop at all permissive signals on extended territories. When the Rock Island installed automatic train control in 1923, a rule was adopted reading as follows: "On two or more tracks, when a train encounters a stop-and-proceed signal at stop, Rule 501a, it may proceed without stopping, at restricted speed, if engine is equipped with train control device which is in service and operating properly." In this case, as well as in those referred to later, an engineman proceeding in a block is required to watch for a train, an obstruction, a misplaced switch, a broken rail or anything that would interfere with train operation. On railroads using continuous automatic train control, with cab signals and no wayside permissive signals, no stops are required at wayside locations, minimum speed being enforced by the speed control

system. Such a system is in service on 511 miles of double-track line on the Chicago & North Western between Chicago and Council Bluffs, Iowa, the first section being installed in 1925, followed by other territories during 1926, 1927 and 1928. On territories of the Illinois Central where continuous cab signaling and automatic train stop, without speed control, are in service without wayside permissive signals, no stop is required at the wayside locations, the speed in the "red" block being limited by rule to 15 m.p.h. This system has been in service on 122 miles of double track between Champaign, Ill., and Branch Junction since 1926, and on 97.6 miles of single track between Waterloo, Iowa, and Ft. Dodge since 1926.

Adopting this practice on a much broader scale, in March, 1930, the Illinois Central modified its Rule 282 (the "Stop-and-Proceed" rule, Code 291) on all divisions outside of the Chicago terminal, the timetable rule reading as follows: "On two or more tracks; trains may pass 'Stop-and-Proceed' signals without stopping, proceeding at a speed of not exceeding fifteen (15) miles per hour." In July, 1933, the rule was made effective on single-track lines where absolute permissive automatic block signaling is in service. Thus, for several years the Illinois Central has had this rule in effect on other than automatic train stop territory, on 1,375 miles of multiple track and 995 miles of single track.

Problem Again Deserves Study

Many roads may not consider it advisable to change their practice as the Illinois Central did. Nevertheless, it may be advisable to secure the benefits at a great many locations by the more extensive use of the markers now used only at signals on ascending grades. Some

signal engineers may raise a question to the effect that if trains are not to be required to stop at a signal, why should not Code Rule 290, aspect A (red-over-yellow) be used, giving an indication—Proceed at restricted speed?

Referring again to the answers in the November issue, it will be seen that the New York Central uses the regular grade markers at locations where only freight trains are to eliminate the stop, while at locations where both passenger and freight trains are permitted to pass without stopping, the red-over-yellow aspect, Code Rule 290, is used. At locations where it is desirable to keep trains moving without stopping them at signals on grades, the Lehigh Valley has for years used Rule 501GG, Indication—"Proceed at slow speed with caution, prepared to stop short of train or obstruction," Name—Caution-slow-speed signal. In semaphore automatic signal territory, a short lower arm is fixed at 45 deg., this arm being illuminated at night. Where position-light automatic signals are used, the aspect is a horizontal row of lights over a row of lights at 45 deg. in the lower right-hand quadrant. On some long ascending grades on double track in mountain territory, the Atchison, Topeka & Santa Fe controls the signals on the up-hill track so that the most restrictive aspect displayed is 45 deg. for the semaphore blade, and the yellow light.

Regardless of the type of markers used or the aspect adopted to eliminate train stops at permissive signals as a means of reducing train delays, the key to the entire problem is whether the operating officers will accept the responsibility for their enginemen observing the rules with respect to train speeds and caution when proceeding in a block under the authority of a permissive automatic signal.

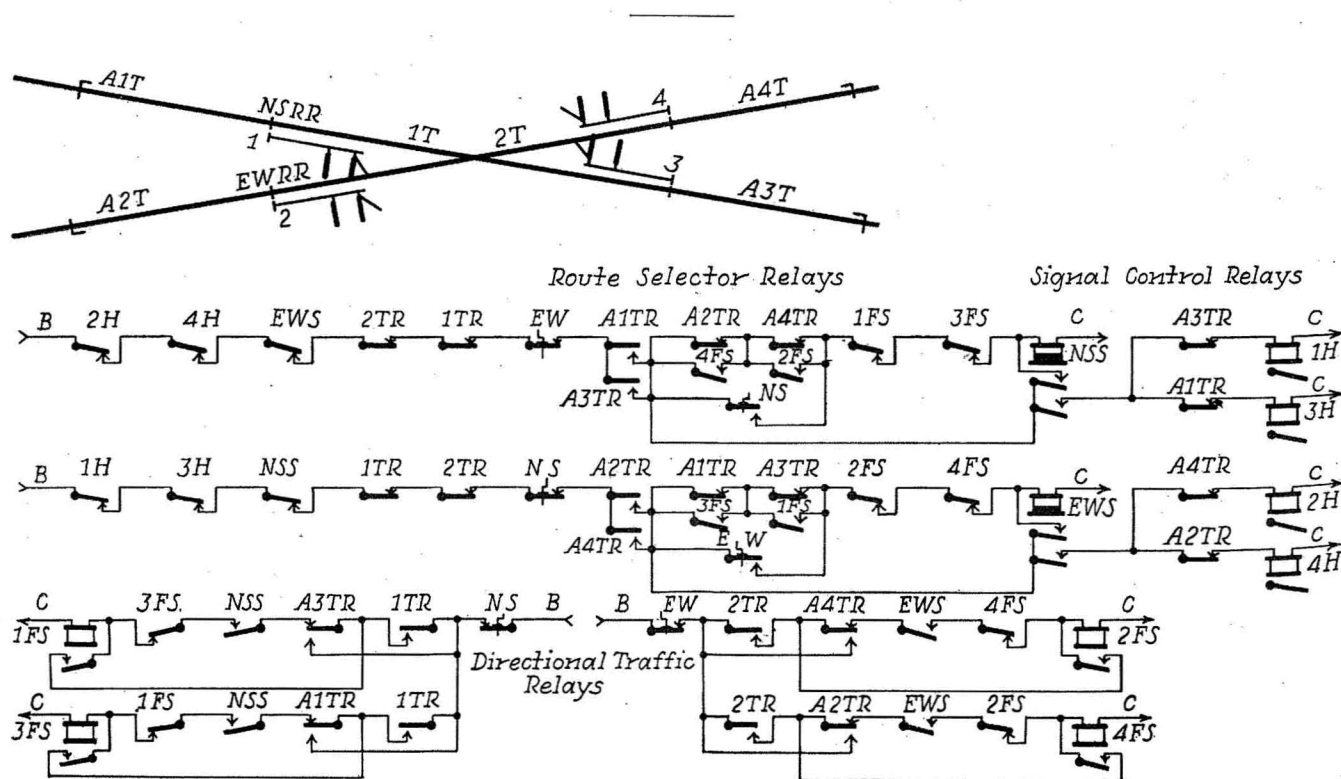


Diagram of circuits for automatic interlocking as explained in article on the opposite page