

Editorial COMMENT

Non-Stop Permissive Signals

ONE means which would aid in securing maximum utilization of existing railroad facilities during the present emergency would be to eliminate train stops at permissive automatic block signals when the Stop-and-Proceed aspect is displayed according to Rule 291, the indication of which is "Stop—then proceed at restricted speed." The change proposed is to substitute Rule 290, "Restricting," the indication of which is, "Proceed at restricted speed," by which means the delay entailed in first stopping a train before proceeding at restricted speed, is avoided.

Before discussing means for changing the aspects and indication, it might be well to make an analysis of the savings in train time that are possible. Where the block is occupied by a train which has been stopped by circumstances which will not be cleared up for an extended time, the second train, after stopping at the Stop-and-Proceed signal, will proceed at restricted speed to a point short of the first train and then wait an indefinite period; here the question whether this second train lost time by stopping at the signal is of no consequence. Such cases, however, are rare as compared with those in which the train ahead is just getting into the clear at a siding or is clearing interlocking release limits after clearing the route for an oncoming following train. In such instances, the time lost by stopping the second train at the Stop-and-Proceed signal is wasted. The time lost and the fuel wasted in stopping and starting a train, as compared with those resulting from reducing the speed to 15 or 20 m.p.h. and continuing at that speed, depend on the tonnage, the rating of the locomotive, the grades and the curvature, as well as weather conditions. Thus the time loss may vary from two to five minutes or more and the cost may vary from \$1 to \$5 or more. Methods for calculating these items are explained in the proceedings of the Signal Section, A.A.R.

The same degree of safety is provided by Rules 291 and 290, because in either case the rule prescribes that the train is to proceed at restricted speed prepared to stop short of a train, obstruction, or other object that may require the speed of the train to be reduced. Obviously the same alertness of enginemen and the same supervision to secure observance of and obedience to restricted speeds is involved with respect to Rules 290 and 291.

Idea Not New

On territories where continuously-controlled cab signaling is in service without wayside automatic signals, there is no such thing as a "Stop-and-then-proceed" as-

pect, the most restrictive indication being, "Proceed at restricted speed." This practice has been followed for years on sections of the Chicago & North Western, the Illinois Central, the Central Railroad of New Jersey, and the Pennsylvania. On other roads where the wayside automatic signals were continued in service in conjunction with continuously-controlled cab signaling, the rule applying to the aspect shown as Rule 291 was changed to omit the requirement that trains must first stop before proceeding at restricted speed.

The next step, that of omitting the train stop at automatic signals where cab signaling was not in service, has been adopted for many years on numerous roads at certain signals on ascending grades where trains encounter difficulty when starting, or in towns where trains, when being stopped and started, obstruct street crossings at grade for periods longer than necessary. In such instances, the signals at which the stop can be omitted are so designated by special markers. On multiple-track lines signaled for one direction, and likewise on single track where grades in one direction only are involved, the markers are fixed signs. On tracks signaled for either direction, and where grades in both directions are involved, the markers are operative and are directionally controlled for following moves.

A next and more important step, that of omitting the stop at all permissive automatic block signals when displaying the most restrictive aspect, was inaugurated on the Illinois Central, which modified its Rule 282 (the "Stop-and-Proceed" rule, Code 291) on all divisions outside of the Chicago Terminal in March, 1930, so that the time-table rule reads 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.

Practice on the Illinois Central

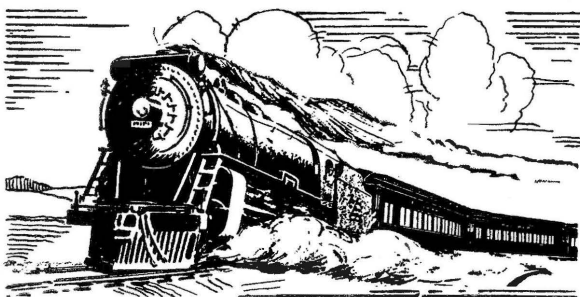
The practice of the Illinois Central has the advantage that the change-over to omit the train stops can be accomplished without expense for any changes in or additions to the aspects or the controls of signals. The system of aspects is logical, in that the most restrictive aspect of a permissive signal is an arm in the horizontal position and/or a single red light, but in each instance the aspect is modified by the presence of a number plate. It may be contended that the use of the red light is logical without requiring a stop to be made, because in this instance the

aspect of the wayside signal is equivalent in all respects to the most restrictive aspect of a cab signal. Furthermore, red is accepted as the color to convey a message of potential hazard, although not, as in this case, of hazard immediately beyond the signal but rather at some point which may be at a considerable distance. The absolute signals, such as interlocking home signals or head-block signals, display the Stop aspect, Rule 292, and are so designated by the absence of a number plate.

Other Aspects Used

On the other hand, some roads may contend that the use of a red light aspect should be reserved to mean one thing, i.e., stop. Where it is desirable to keep trains moving without stopping them on ascending 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." The aspect is red over yellow or the equivalent in arms or rows of lights. On some long ascending grades on double track in mountainous territory, the Atchison, Topeka & Santa Fe controls the permissive automatic signals on the up-hill track so that the most restrictive aspect is a yellow light or the equivalent as an arm. On ascending grades of more than 0.5 per cent, the Union Pacific is using automatic signals in which the red lamp is not displayed, the most restrictive aspect being yellow in the signal head over a yellow in a marker on the mast. On a certain portion of another large railroad system, new automatic signals were installed recently in which the Stop-and-Proceed aspect is not used, the most restrictive aspect being red-over-yellow, Rule 290, Restricting, and the indication is "Proceed at a speed not exceeding that which will enable train to stop short of train ahead, obstruction, switch not properly lined, lookout for broken rail, and not exceed slow speed." Slow Speed is defined as "not exceeding 15 m.p.h." This signaling is in service in territory where the grades, for the most part, are practically level.

Thus, this possibility of avoiding train stops at permissive signals which are displaying their most restrictive aspect has been considered on many roads for years, but only a few roads have yet been willing to take action. From a signaling standpoint, the problem is simple. At this time when every logical means should be employed to save train time, every road might well investigate the possible benefits. The decision to permit omission of the stops must be made by the management of a railroad. The responsibility of the operating officers for their enginemen observing the rules with respect to train speed and observance of caution when proceeding after passing the signals, is the same whether the stop is required or omitted.



New Books

Storage Batteries

By George Wood Vinal, Sc. D., physicist, National Bureau of Standards; third edition, 6 in. by 9 in., 464 pages, 170 illustrations. Published by John Wiley & Sons, Inc., New York, \$5.00.

This book summarizes the physical and chemical facts and theories in regard to storage batteries, and describes their various applications. The present book recounts advances made by the battery industry during recent years and a considerable part of it deals with engineering developments. Previous editions of this book were published in 1924 and 1930, and practically all of the chapters have been revised. Chapter X, on applications of storage batteries, has been completely rewritten. This book covers materials of manufacture, the electrolyte, theory of reactions, capacity, operation, resistance, efficiency, testing and present day uses of storage batteries. The chapter on present day uses of storage batteries should be of particular interest to those engaged in railway signaling and communications, in addition to the engineering information set forth in the remainder of the book in that the application of storage batteries to telephone systems, signaling, interlocking, centralized traffic control and car retarders is included in this chapter.

Railroad Operation and Railway Signaling

By E. J. Phillips Jr., 209 pages, numerous illustrations and diagrams, published by Simmons-Boardman Publishing Corporation, 105 W. Adams Street, Chicago, \$1 for single copy or in bulk orders of 10 copies or more to one address, payment sent with order or guaranteed by one responsible person, each copy 75c.

This book consists of the articles which appeared serially for the last three years in issues of *Railway Signaling*. The discussion, for the most part, is limited to the basic principles, applicable on all railroads.

The material in this volume has been prepared with the primary objective of explaining the relationships existing between train operation and railway signaling. It should be of interest and value, therefore, to operating officers who use signaling in the handling of trains, and to signal engineers and their assistants who plan signaling for maximum efficiency. Younger men just promoted to supervisory positions in the operating department, and young men entering the signal department, should find the book helpful because of its presentation of the purposes, advantages, and disadvantages of the various systems in relation to train operation.

The text has purposely been prepared in the form of questions and answers so that the reader may know the objective of the information given, and to place emphasis upon the "why" and "how" of railway signaling and railroad operation. This arrangement makes the material particularly suitable for self-instruction and for use in educational classes.