

Lights vs. Arms for Railway Signaling

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SINCE it has been definitely demonstrated after many years of use, that at night colored lights have satisfactorily provided the means of transmitting various degrees of information and instruction to trainmen, it is safe to assume that a continuation of such a system of "Colored Night Signals" is in line with good practice, and can be relied upon as a distinct means of indicating to trainmen what action should be taken by them in the handling of their trains.

Having proved the utility of colored light signals for night indications, there is no good reason why such use cannot be extended by using the same colors for daylight service, eliminating the arms and other moving parts, provided sufficient intensity of light of a distinctive color is furnished. Without doubt, such distinctness in colored lights for daylight signaling is now available, thus pro-

light, or two, or three lights in vertical line now constitute the night stop signal, whereas by day such arms are displayed horizontally, hence a variance which is not consistent, and while it is thoroughly understood, does not by any means prove its correctness. Then, again, under the present system we have no distinctive permissive night signal, as in the use of ordinary manual block signal the same color light (yellow) is displayed, indicating "proceed, block occupied," as is displayed in automatic block signal territory indicating "block unoccupied"; hence there is here much room for improvement, and a change should be made to correct a possibility of mistaking the indication. As we are now able to apply a system of distinct readable light aspects for daylight signaling, there is no valid reason why we should continue to install complicated mecha-

Route	All Routes	Main Route					Restricted Route					Slow Route			
Day and Night Aspects															
	Indication	Stop	Stop, Then Proceed	Proceed, prepared to Stop short of Train or obstruction	Proceed, prepared to Stop at next Signal	Proceed	Stop, Then Proceed	Proceed, prepared to Stop short of Train or obstruction	Proceed, prepared to Stop at next Signal	Proceed, next signal at Restricted speed	Proceed, Approach next signal at Restricted speed	Stop, Then Proceed	Proceed, prepared to Stop short of Train or obstruction	Proceed, prepared to Stop at next Signal	Proceed
Name	Stop Signal	Stop and Proceed Signal	Permissive Signal	Approach Signal	Clear Signal	Stop and Proceed Signal	Permissive Signal	Restricting Signal	Clear Restricting Signal	Approach Restricting Signal	Stop and Proceed Signal	Permissive Signal	Approach Signal	Clear Signal	

Illuminated Lights are Indicated by, P, Purple; R, Red; Y, Yellow; G, Green; and W, White

ducing a means of simplifying the reading of signal indications, as well as reducing the cost of construction and subsequent maintenance and operation.

The Present System of Indications

Our present system requires the use of arms in the horizontal, diagonal, vertical positions for daylight signaling. At night these arms (which are required to operate in conjunction with the lights displayed) are of no use, as the instructions and information transmitted to trainmen are through the medium of colored lights, viz., red, yellow, green.

It will be recognized that the day and night indications differ from each other very materially, in that by day the position of the arm transmits the information, whereas at night the color of the light serves the purpose. Consequently the use of both does not simplify the language of signals, but instead complicates it. Then again, the same position of the arm and color of the light indicate two different conditions, which, although permissible, cannot be accepted as the best practice.

It is to be expected that these discrepancies are to be corrected and the requirements fully covered in the proposed system of signals. The present combination system requires the memorizing of many different aspects as will be seen on the attached diagram. One red

nisms, either mechanical or electrical, for the purpose of operating signal arms.

Proposed System of Signal Indications

The colored lights in the proposed system will be the same as those used in the present system, viz., red, yellow, green, with the addition of "Lunar White," a new distinct signal proposed to be used for the purpose of route marker, and purple, a well known color, proposed to be used for permissive movements and for slow speed routes, thus assigning and holding for the three primary needs the three colors first mentioned.

Granted that arms displayed at various angles properly transmit the desired information to trainmen, it being conceded that present practice in day signaling is good, distinct and understandable, it is, therefore, logical to assume that to display the same indications by means of the various angularities of lights is following along the lines of good practice. With this as a basis, the following angularities of lights can be readily accepted as better filling our needs for both day and night signaling, viz.:

Two red lights in horizontal line—Stop.

Two purple lights in diagonal line, right to left—Proceed permissively.

Two yellow lights in diagonal line, left to right—Proceed, prepare to stop.

Two green lights in vertical line—Proceed.

With the exception of the additional colors "Lunar White" and "Purple" it is observed that the same three colors for the purposes required are proposed to be used as is now our practice, hence the ease with which such aspects can be read and understood by trainmen is apparent. This proposed system utilizes five colors and four positions to meet the five requirements under the rules, and which cannot be distinctly and properly accomplished otherwise.

Current for these lights can be obtained either by the use of battery or from a power source, and their control will be through the medium of relays as between the lights and the levers, or track conditions affecting them. The principle involved is one of causing the lights to be extinguished or lighted as the conditions require. In brief, instead of applying mechanisms with their connections and intricate gearing and parts, lamps are used both for day and night signaling.

From a study of the proposed indications in compari-

son with those now our standard, it must be concluded that the new system in its entirety is simpler than the present. The underlying color principles of present night signaling is not set aside, and this renders it much easier to commit to memory where changing from the old to the new system. A runner having absorbed mentally the present night light indications will find no difficulty in reading the same colors in daylight.

Then, again, the positioning of the lights is an added factor of distinctness, as four angles of lights are provided for the four primary conditions to be met, which, aside from color, lends itself to a more conspicuous display of the indications required.

The basic arguments in favor of the proposed system are: (1) The day and night indications are the same. (2) Instead of trainmen being required to memorize so many aspects, they are required to commit to mind but 14, as will be seen by reference to the diagram. (3) Reduction in the cost of construction and maintenance.

Railroads Argue Against Automatic Stops at I. C. C. Hearing

Carriers Claim Devices Are in Development Stage at This Time and That the Proposed Order Is Too Drastic

CLAIMING that no automatic train stop or train control device has been sufficiently developed to warrant installation on such an extensive scale as is outlined in the proposed order of the Interstate Commerce Commission and that the American Railway Association is diligently working for the development of a practical device which will meet the Commission's order and serve the purpose of the railroads, Alfred P. Thom, counsel for the Association of Railway Executives, speaking at the hearing in Washington on March 20, urged that the Commission refrain from issuing such an order. A committee of the American Railway Association, representing 40 of the 49 railroads included in the proposed order, presented supporting evidence. This evidence was presented by R. H. Aishton, president of the American Railway Association; C. E. Denney, vice-president and general manager of the New York, Chicago & St. Louis, and chairman of the railroads' committee; A. M. Burt, assistant to the vice-president of the Northern Pacific, and J. A. Peabody, signal engineer of the Chicago & North Western. The hearing was held before Commissioners McChord, Esch and Lewis. After the carriers' committee had finished presenting its data the individual roads submitted additional statements as to why the order should not be entered against them, or should be modified.

Mr. Aishton outlined the formation of the joint committee and the co-operation of the American Railway Association with representatives of the Bureau of Safety of the Interstate Commerce Commission and said that in connection with the work the association in the last 15 months has spent \$20,000. Mr. Aishton said that the carriers' committee does not represent the Chicago & Eastern Illinois, the Chicago, Rock Island & Pacific, the Long Island, the Norfolk & Western, the Pennsylvania, the Philadelphia & Reading, the Pittsburgh, Cincinnati, Chicago & St. Louis, the West Jersey & Seashore and the

Chesapeake & Ohio. Continuing, he said:

"The following questions naturally presented themselves for answer:

"(1) Has automatic train control reached a point of development reasonably justifying an order requiring its extensive installation at this time? The committee's answer to this is, No. * * *

"(2) If installation for further tests is advisable, is duplication of tests necessary? The committee expresses the opinion that such duplication will not serve any practical purpose.

"(3) Are further developments probable; or other principles than those now being advocated and under development? The committee is of the opinion that induction methods of train control are being rapidly developed and that tests now being arranged for will give valuable information and promise progress.

"(4) Are the proposed requirements such as best cover the situation? The committee will propose amendments.

"(5) The committee has not entered into the financial side of the question in any manner, but it is a serious question for this Commission whether automatic train control will provide greater additional safety for a given expense than the same expenditure will produce through the installation of automatic signals, extensions of double track, etc., * * * and other improvements which not only increase safety, but increase the capacity of the railroad and produce large economies in operation. It is an open question, whether any of the devices so far tested do not have a tendency to decrease the capacity of a railroad.

"The policy of the railroads is now, as it has been in the past, that within their financial ability they are continually seeking to find better methods for promoting safety as well as economy and the production of better service. Applications to the Commission for authority for financ-