cars for warning track men or for warning at road crossings. We believe that it is safer to put the entire responsibility on the man operating the motor car. If he has no warning device, he will handle his car more carefully and approach danger points with his car under control, prepared to stop. If he has a warning device, there is a temptation for him to sound it and proceed expecting his way to be cleared."

Frank E. McAllister, president of the Kalamazoo Railway Supply Company, states: "We have been furnishing trip gongs and foot gongs for this purpose and during the past year, on the majority of the maintainers' cars that we have equipped with a gong, the foot-operated type seems to be the more popular."

Robert D. Sinclair, president of Fairmont Railway Motors, Inc., advises: "At the present time we are equipping our motor cars with 10-in. gongs, when so specified by the railroads who purchase them. This matter of warning devices seems to be something about which every railroad has its own ideas and, of course, we, as manufacturers, simply comply with specifications in that respect. Probably the simplest and most efficient warning device is the 10-in. loud-sounding gong, either foot- or hand-operated."

Approach-Lighting a Leaving Signal

"In approach-lighted territory how do you convey a leaving-signal indication to a train standing on a siding?"

Push-Button Switch on Relay Case at Head-Block Location

By C. A. DUNHAM

Superintendent of Signals, Great Northern, St. Paul, Minn.

HEAD-BLOCK signals on single track are normally approach-lighted through a back contact of the track relay in the rear. Passing tracks are not track-circuited. Switch circuit controllers are designed to shunt the track with the point of the switch open ¼ in. or more. A train with authority to leave the siding would, by rule, remain clear of the fouling circuit until the main-line switch has been opened. After the switch has been opened the signal will be lighted, by reason of the track being shunted through the switch circuit controller.

However, when a train is leaving a siding the trainmen may operate a push button on the instrument case at the head-block location; this push-button switch, when pressed, connects around the back contact of the track relay normally used for the approach lighting, and thus lights the leaving signal. The operating rule is: "On single track, push buttons are provided on automatic signals of the color-light type located at the leaving ends of sidings. Engineman and trainmen with trains on sidings, clear of bonded rails and insulated joints and with main-track switches closed, shall use this push button to obtain the signal indication, if required by the train about to enter the block."

Short Extension of Fouling Circuit Has Been Given Consideration

By W. J. ECK

Assistant to Vice-President, Southern, Washington, D. C.

IN approach-lighted signal territory it is our practice at the present time to use a 3½-watt continuously-lighted lamp on leaving signals, in order that trains on the siding may receive an indication before entering the main line.

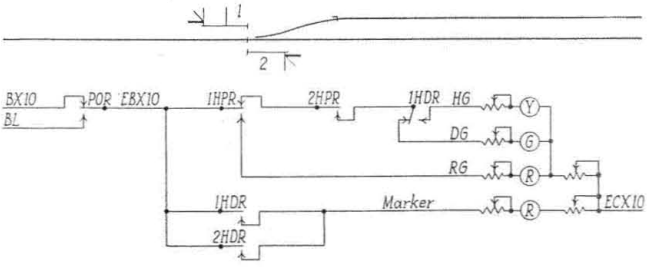
Some consideration has been given to an arrangement consisting simply of extending the fouling circuit one rail length back of the clearance point and installing a special sign at the end thereof so that cars will not be left on the fouling circuit. A train when about to leave the siding would pull up to the marker post and, by short-circuiting the track circuit, light the leaving signal. There are of course some disadvantages in this arrangement, as it decreases the effective length of the siding, and therefore this scheme has not been tried out.

Special Approach Control

By J. H. OPPELT

Signal Engineer, New York, Chicago & St. Louis, Cleveland, Ohio

WHERE approach lighting is used in connection with A.P.B. signaling and it is desired to give an indication on a leaving signal to a train on a siding, the simplest method is to install a short approach track circuit on the siding, through which the leaving signal may be lighted. However, the cost of installing such circuits, together with the cost of maintenance and operation, creates an item of expense that largely offsets the savings of approach lighting.



Leaving signals are lighted upon the approach of opposite-direction trains

With the ordinary schemes, the leaving signal may be lighted by opening the siding switch, but it is not desirable to do this, as it may cause a signal to go to stop in the face of an approaching train and thus cause a needless delay.

The scheme that we are using in A.P.B. territory is predicated on the supposition that a train will not remain any great length of time on a siding and that the meets are fairly close. A train lights only one signal at a time in advance of itself, excepting when it is approaching a siding, in which case the leaving signal in the direction of traffic is lighted from the cut section beyond the farther end of the siding from the signal in question. The opposing leaving signal is lighted as soon as it assumes the stop position. With this arrangement, the train on the siding is informed of the approach of an opposing train. The lighting circuits for the leaving signal are shown in the sketch.

Telegraph offices are usually located between the ends of sidings and the lighting of head-block signals when a train leaves the adjacent siding is good information for the operator.

Leaving Signals Are Continuously Lighted

By P. M. GAULT

Signal Engineer, Missouri Pacific, St. Louis, Mo.

WE approach-light all of our intermediate color-light signals where it can be accomplished without additional line wire or apparatus. All absolute signals and all signals governing into passing siding limits are continuously lighted.

The absolute signals are continuously lighted for two reasons: One, to give information to a train not on the approach section, and the other, for the benefit of motor car operators and other employees, who may secure the benefit of the indication to govern their movements in anticipation of the approach of a train.

The entering signal is continuously lighted for the benefit of motor car operators and also to make it possible to use it as an indicator of the approach of a train from the next station beyond the other end of the siding.

All of our red units are provided with back-lights so that the signal indication may be checked from the rear of the signal and to make possible the use of signals for indicator purposes.

We use commercial power with storage battery standby for all of our color-light signals, and we believe we are well repaid for the small cost of the additional power required to light these signals continuously. If we were not using commercial power it might be desirable for the sake of economy to approach-light all signals and to use push-buttons or other devices to light the absolute signals when the approach-lighting track circuit is unoccupied.

Dwarf Signal Aspects

"What colors do you use for the indications of dwarf signals? Is red preferred to purple for the stop indication? Where and why?"

Purple at Outlying Interlockings

By W. H. Elliott

Signal Engineer, New York Central, Albany, N. Y.

WHERE dwarf signals are used in lieu of high signals, as around terminals where a considerable amount of switching is done and where all movements are made at moderate speed, it is proper to use red for a stop indication. Red is more readily distinguished and due to the frequency and importance of the movements it is desirable that the best indication practicable be used.

Where dwarf signals are used at outlying interlockings where speed of trains is high it is not desirable that the engineman's attention be taken from the high signals or switch stands as might be the case if red were used on dwarf signals. At such locations purple lights for dwarf signals are preferable as this color gives an indication amply distinctive. Dwarf signals are cleared at such locations only to give slow-speed indications, which are read from a short distance.

Enginemen Favor Red and Yellow

By W. Y. Scott

Signal Engineer, Boston & Maine, Boston, Mass.

THE Boston & Maine uses red for stop and yellow for proceed. For years we used purple for stop and green for proceed, but when we commenced to install light-type signals, we found that a purple light in the daytime gave a very poor signal indication and red gave a very good indication, and as red is the proper stop signal, we at that time changed our dwarfs to red for stop. We find that this change meets the approval of our enginemen, as they now have only one purple light and that is on a sidetrack derail.

Purple at Interlockers; Red at Drawbridges

By C. H. Morrison

Signal Engineer, New York, New Haven & Hartford, New Haven, Conn.

AT interlocking points, we use purple for stop and yellow for proceed. For back-up signals at drawbridges, we use red for stop and yellow for proceed. In manual-control block signal territory the absolute signal aspects are red for stop and green for proceed. The object of using purple at interlocking points is, first, to differentiate between a dwarf signal indication and a red lantern either on the ground or being carried by a man and, second, purple rays of light with a given amount of light intensity, do not carry so far as the other colors and, therefore, the number of aspects that are visible to an engineman at a distance is decreased. Where red is used, enginemen are not permitted to pass the dwarf signal except by authority of written orders.

Aerial Cable or Open Line?

"To what extent do you use aerial cable for line control circuits for automatic block signaling and centralizer control installations? Why?"

Aerial Cable for Centralized Control Installations and Where Pole Line is Heavily Loaded

By G. H. Dryden

Signal Engineer, Baltimore & Ohio, Baltimore, Md.

IN automatic block signal territory, either single or double track, we generally use No. 10 AWG double-braid weatherproof Copperweld 30 per cent conductivity line wire. We believe this to have a longer life and to be cheaper to install than aerial cable and, furthermore, all line wires required for such installations can be placed on one crossarm.

However, we use cable where Western Union pole lines are heavily loaded and there is not sufficient room to receive an extra crossarm; also where the number of control wires is greater than can be placed on a ten-pin crossarm, for example, in controlling outlying switches.

In controlled manual block territory we have installed braided aerial cable between the telegraph office and passing siding outlets for the reasons named above. Centralized traffic control presents a different problem. Station operators are removed and all dependence is upon the signal system plus telephone communication between the trainmen and dispatchers. High strength construction is necessary. Neither signal nor telephone circuits should be destroyed by weather conditions. Breakage of telephone and telegraph wires located on upper crossarms should not cause interference with the dispatcher's circuits and for that reason we feel that such wires should be in cable, the latter supported on not less than 3/8-in. messenger.

C. A. Christofferson, signal engineer of the Northern Pacific, states that "except in a few cases, we have never used aerial cable for line control circuits for automatic block signals. The Northern Pacific is practically a single-track railroad, having only 600 miles of double track, and on a single track railroad changes are being made continually. Aerial cable would be an expensive nuisance as the aerial circuits are being shortened and lengthened at frequent intervals. Why use aerial cable when single wire is cheaper and there is plenty of room on the pole line?"