

tween levers to such an extent as to make it impossible to reverse a signal lever governing a route until the indication has been received. Therefore, it was believed that indication magnets were unnecessary insofar as the performance of the plant was concerned, because all of the other electrical features have been retained. When the switch machine completes its throw, the dynamic indicating current operates an indication selector and the signal controls are so arranged that a signal will not clear unless all of the switches have returned a dynamic indication and have operated their respective indication selectors accordingly. All of this is accomplished, however, without any delay in releasing the mechanical locking between levers, which is used in order to enforce a predetermined sequence.

In addition to the other features, a new type of color-light dwarf signals was developed especially for the Cleveland Terminal, the special requirement being to provide a fourth indication to be used when desiring to close up two trains on one track, the special aspect being red over yellow, which indicates to the engineman "proceed at slow speed prepared to stop short of another train which is occupying this track." This fourth indication is of particular assistance when making switching movements.

These unique developments mark a forward step in the evolution of interlocking and signaling practice. The Cleveland plant is, therefore, one that may be accorded an unusual place in the record of progress in the field.

Directional Control and Approach Lighting

MUCH interest has been shown in the "What's the Answer" discussion of the question regarding the advisability of permitting opposite-direction signals to clear after a train passes. Some roads have given this question serious consideration, and plausible arguments have been offered both for and against the idea. Those roads whose A.P.B. circuits preclude opposite-direction signals from clearing as soon as a train clears the insulated joints at the signal location, take the stand that there should be no "loopholes" which, under even the most improbable circumstances, can permit a hazardous condition to exist, and cite two possibilities to support their practice.

The first is that condition wherein a westbound train enters a block, passes the opposing distant-to-entering signal, then stops and reverses its direction out the block. Under these circumstances, if a following westbound train were approaching the headblock signal, it would be possible for the two trains to accept caution signals simultaneously and meet head-on. While this set-up is obviously an improbable one and is quite effectively covered by operating rules which compel a train to reverse its direction out of a block only under flag protection, nevertheless the idea of permitting false caution signals to be displayed is at variance with the fundamental precepts of signaling.

The second and more serious hazardous condition is emphasized by Mr. Bell, (see page 263, July issue), wherein a westbound train might pass entirely through a clear block and the directional relay at the first intermediate westward signal fail to release. An eastbound train would then be compelled to flag through the block to the distant-to-entering signal, which might then display a caution signal simultaneously with a caution indication on the opposing adjacent head-block sig-

nal, thus permitting the two trains to pass their respective signals simultaneously and meet head-on running at caution speed, each having reason to suppose that the track is clear at least as far as the next signal.

These are the principal objections that have been offered to the affirmative practice. Adherents of this practice claim, however, that the operating rules effectively cover the reverse movement of a train out of a block, but they do not reckon with the second and more hazardous condition stated. It would be interesting to know the attitude of trainmen toward the clearing of these signals. Do they make use of the information given by such a signal? It is not inconceivable that under certain conditions it would be highly desirable that the indication of these signals should depend only upon conditions in advance of them.

However, even where these signals are permitted to clear, there is an inconsistency in that, even there, single intermediate signals do not clear behind trains, since their control is nearly always selected through a back contact of the adjacent opposing stick relay, in accordance with almost universal practice.

If uniformity is desired, the logical choice is to preclude all such signals from clearing behind a train, which objective is easily effected at double locations by simply selecting the signal control through a back contact of the directional relay for the signal on the opposite side of the track, at single locations as stated above.

If uniformity is not considered a cardinal virtue, and the benefits of the affirmative practice are desired, this circuit selection can be dispensed with and the two hazardous conditions mentioned can be eliminated by slotting all the headblock signals through one track circuit in the rear of the adjacent distant-to-entering signal. This would retard following moves somewhat, which might or might not be objectionable.

There is still another aspect that apparently has not been considered: If we do not permit these signals to clear, why not make our lighting effective only for approaching, and not for leaving, trains, and thus effect a saving in lamps and batteries, which should be most appreciable in primary-battery territory. This could be accomplished at no extra cost by utilizing, for the directional-lighting effect, the stick-relay contact that would ordinarily be used to prevent these signals from clearing. The attitude of operating and signal officers toward this phase of the question would determine the advisability of this practice.

Flexibility in the Control of Highway Crossing Signals

SEVENTY-EIGHT fewer persons were killed in highway-railroad grade crossing accidents in the United States during the first three months of 1930 than in the corresponding period of 1929, according to the statistics issued by the American Railway Association. Although this reduction is encouraging, the fact that the fatalities for the 1930 period mentioned are still as high as 484 serves to emphasize the fact that there is a fertile field for the installation of highway crossing signals, as well as for the improvement of such equipment to insure that the average automobile driver will develop a greater sense of responsibility in the observance of the signal indications. Many railroad men are giving this subject serious thought and the results secured contribute in no small measure to the reduction in the number of accidents.