

Trainmen Control Highway-Crossing Signals on E. J. & E.



Control station in which a four-way switch is used. . . . The unit at the right, on the top of the pipe stand, is the momentary-contact special-control switch (lever has been removed) which, if in service, would enable the foreman of a switching crew to stop the operation of the flashing-lights when the track circuit is occupied. This momentary-contact switch has been tried out but is not now in service; it may be used in the future, however, if appreciable delays to highway traffic are encountered due to trains standing on the track circuit but not actually on the crossing

TRAINMEN control the operation of the flashing-light units of the highway-crossing signals recently installed by the Elgin, Joliet & Eastern in East Chicago, Ind., where six tracks, five of which belong to the Indiana Harbor Belt Railroad, are crossed at grade by 129th street. Five exposed, weather-proof, three and four-way control switches, mounted on pipe stands (see illustration) at conveniently accessible points within 150 ft. of the crossing are wired to signal-control relay *ITPR* (see Fig. 2) in such a manner that the operation of any one of these switches causes the flashing lights either to start or stop operating, depending upon whether the signals were or were not operating before the trainman operated the control switch.

In addition to this manual control by the trainmen, automatic operation is provided, a single track circuit (see track plan), comprising approximately 200 ft. of each track over the crossing, being used for this purpose. Whenever a train is standing on any part of this track circuit, the flashing lights operate, and, in addition, the color-light S-T-O-P sign on each signal is lighted and the bell (on one signal only) sounds its warning. It is impossible for a trainman, by operating any of the five manual control switches, to stop the operation of any

Uncommon solution of control problem where switching movements, only, are made Five control stations serve six tracks Automatic control is supplementary

part of the signal system while a train is standing on any part of the track circuit.

Prior to July, 1931, the vehicle traffic on 129th street was negligible, as 129th street was not then paved in the vicinity of the railroad crossing. However, after the street had been paved, the U. S. and Illinois state highway departments rerouted certain main routes over this section, and the necessity for highway-crossing-signal protection at once became apparent. Only switching movements are made at this crossing. Approximately 20 such movements are made each 24 hours on the five tracks of the Indiana Harbor Belt line and 350 on the

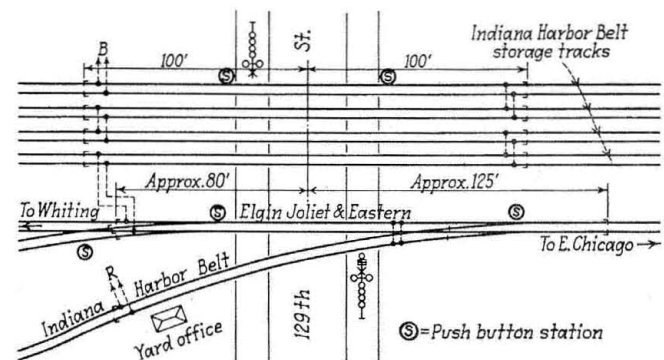


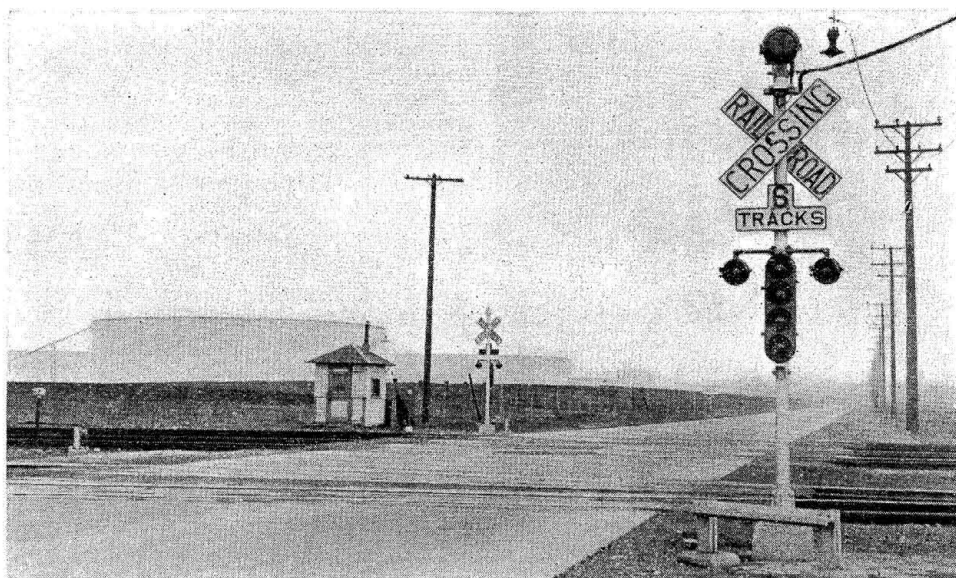
Fig. 1—Layout plan, showing approximate location of the five control stations, at any one of which a trainman can start the flashing-lights operating or turn them off

E. J. & E. Prior to the installation of the present system, these train movements were protected only by trainmen flagging the crossing, and, furthermore, every train was required to come to a stop before proceeding across the highway. It is evident that this condition was highly unsatisfactory.

In deciding upon a suitable control system for the op-

eration of the proposed signals, consideration was given to several different systems. Straight automatic operation was inadvisable, due to the multiplicity of yard tracks and the nature of the switching moves. Manual control by a part or full-time crossing watchman was not feasible, for reasons of economy, and there is no em-

roads, maintains continuously, a special policeman on duty with headquarters at the crossing. Also, the I. H. B. has a small yard-office at the crossing, in which one man is on duty during the day. These, of course, were important factors in the selection of a control system in which exposed control switches are used.



View of the six-track crossing. . . . Three of the five trainman-control stations are visible in this view

ployee, regularly on duty near the crossing, on whom the responsibility for operating the signals could be placed. The outcome was that the railroads chose the combined automatic and manual control system described above, and, although some misgivings were at first expressed,

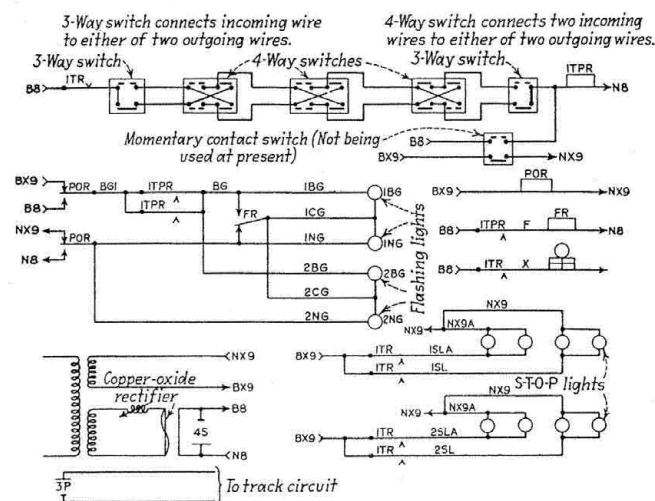


Fig. 2—Circuit plan. . . . Note design of manual control circuit ITPR, which is such that a trainman can turn the flashing-lights on or off at any of the five control stations. . . . By using the three-way and four-way switches as shown, it was possible to run the manual control circuit through any number of control stations with only two wires between stations

due to the possibility that a trainman might fail to turn the signals on or off, the results to date have been entirely satisfactory and there have been no accidents at this crossing, nor has there been any instance of a trainman forgetting to turn the signals on or off at the proper time. Malicious tampering with the signals, as might be expected from neighborhood boys, is precluded by reason of the fact that the Standard Oil Company, whose refineries, located nearby, are served by these two rail-

Flashing-light signals of a standard type are used. Each signal has a $5\frac{3}{8}$ -in. back light mounted integral with the main unit. On each mast is a color-light, vertical, S-T-O-P signal, together with a "6-TRACKS" auxiliary warning marker and the usual crossbuck sign. One of the signals also carries a warning bell. With the present arrangement of circuits, the S-T-O-P signals and crossing bell are in operation only when the track circuit is shunted by a train, as the manual control switches affect only the operation of the flashing lights. This arrangement is experimental, and it is possible that it will be changed to provide that the manual control switches will also operate the S-T-O-P signals and the bell.

Tentative Manual Release

Originally, provision was made, at one of the control stations, for the addition of a spring-actuated switch by means of which a trainman could hold the signals out of operation while the track circuit was shunted, the design being such that the spring would automatically restore the signals to normal operation as soon as the handle was released by the trainman. This arrangement was tested, but, because of certain questions as to liability, was not placed in regular operation. It may, however, be used at some time in the future, if highway traffic is appreciably delayed due to trains standing on the track circuit but not actually on the crossing.

As an examination of the accompanying circuit plan will show, the manual control circuit, featuring two three-way switches and three four-way switches, is similar to an ordinary two-way control circuit as used in residential lighting, except that the use of five, instead of two control stations necessitated a special switch for the three intermediate stations. Each control switch is mounted on a three-inch pipe-stand resting in a concrete base.

This signal system was designed and installed by E. J. & E. signal department forces, under the direction of F. C. Stuart, signal engineer of that road.