Street Crossing

Cantilever extends out at 45 deg. over two streets which cross at 90 deg.

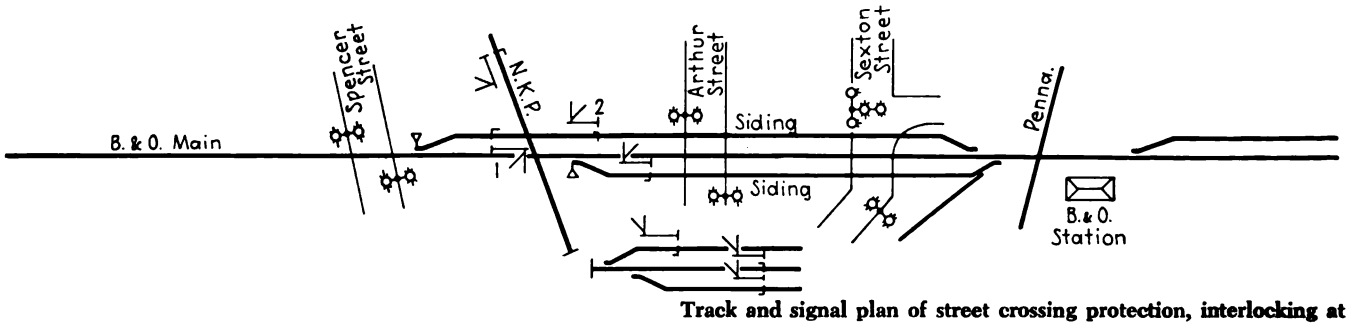
AT Rushville, Ind., the Baltimore & Ohio has recently completed an interesting installation of protection at seven crossings with streets and at two crossings with other railroads. Rushville is 84 miles west of Cincinnati on the single-track main line of the B. & O., between Hamilton, Ohio, and Springfield, Ill., via Indianapolis, Ind. No passenger trains are operated on this division, but about six through freight trains are operated each way daily, also a local freight is operated eastbound one day and westbound the next, except Sunday.

Just west of the Rushville station, an industry track of the Pennsylvania crosses the B. & O. main line. West of the station, 1,163 ft., a branch line of the Nickel Plate crosses the B. & O. Previously, B. & O. trains made stops at both of these railroad crossings resulting in a delay of about 20 minutes to tonnage freight trains.

Within the city limits of Rushville, the Baltimore & Ohio main track crosses eight streets. When trains stopped for the railroad crossings, street traffic was also delayed. Previously, only one of the street crossings—that at Main Street—had been protected by flashing-light signals. At five other street crossings—Perkins, Morgan, Harrison, Sexton and Arthur streets—watchmen were on duty eight hours each day. Train movements on street crossings are restricted by ordinance to 20 m.p.h.

The recently-completed project had three principal objectives: (1) to provide uniform automatic protection in the form of flashing-light signals at all the eight street crossings; (2) to eliminate the train stops at the two railroad crossings, thereby reducing delays not only to trains but also to street traffic; and (3) to increase operating economy.

The signal improvement program was planned with the cooperation of the city authorities and the railroads. The city approved the locating of the flashing-light signals where they would be most effective. Several trees were removed and one fire plug was relocated. Also, the city park department keeps the trees trimmed, so that the signals can be seen readily. The local school authorities exhibited motion pictures in the public schools to teach the pupils to observe and obey the aspects of the flashing-light crossing signals from the standpoint of safety. Films were also shown emphasizing safety on streets, highways and in the home. The city authorities and the people of Rushville



Track and signal plan of street crossing protection, interlocking at

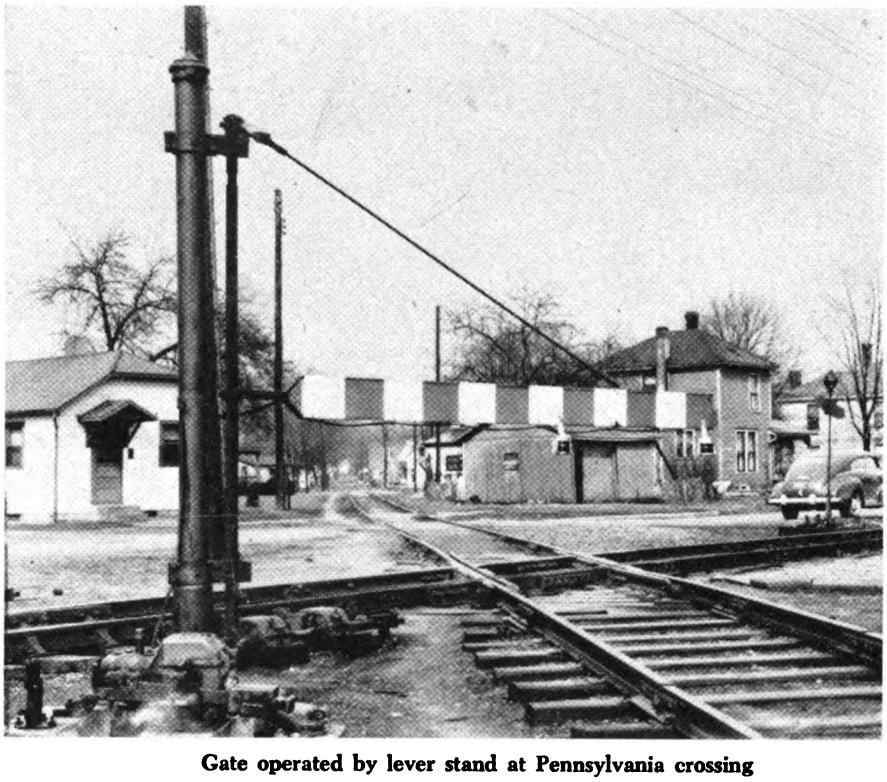
and Railroad Protection Combined

Baltimore & Ohio's project at Rushville, Ind., includes flashing-light signals with special arrangement of bracket masts, gate protection at crossing with industry track of the Pennsylvania, and semi-automatic interlocking at crossing with N. K. P.

have been well pleased with the improvement in safety which has been accomplished by the new automatically-controlled flashing-light crossing signals.

The Pennsylvania switches across the Baltimore & Ohio about twice a day. The gate protecting the crossing is normally placed across the Pennsylvania track. The gate arm is 8 in. wide and 12 ft. long, painted with red and white stripes. Two red gate lamps, electrically lighted, are mounted at the bottom edge of the arm. The gate arm is attached to a 2-in. by 2-in. rocker shaft, set vertically, in bearings attached to a 6-in. pipe mast on a concrete foundation. The rocker shaft is a crank connected to and operated by a conventional switch stand, mounted on a concrete foundation. The hand-throw lever of the switch stand is locked in the normal position by a G.R.S. Model 10 electric lock, and while in that position, holds the gate across the Pennsylvania track. Home signals on the Baltimore & Ohio main track normally display the proceed aspect.

An approaching switch engine on the Pennsylvania is stopped 75 ft. from the B. & O. track. If no Baltimore & Ohio train is approaching, the Pennsylvania trainman removes the padlock from the electric lock, thus operating contacts, which set the B. & O. signals at Stop and start a time-element relay. When 5 minutes 30 seconds has elapsed, and with no B. & O. train in home signal limits, the electric lock is released. The Pennsylvania trainman can then operate the stand to turn the gate so that it obstructs the B. & O. track. After the Pennsylvania train passes over the crossing, the gate is restored to normal position, and the lever is locked with the padlock allowing the B. & O. signals to again clear.

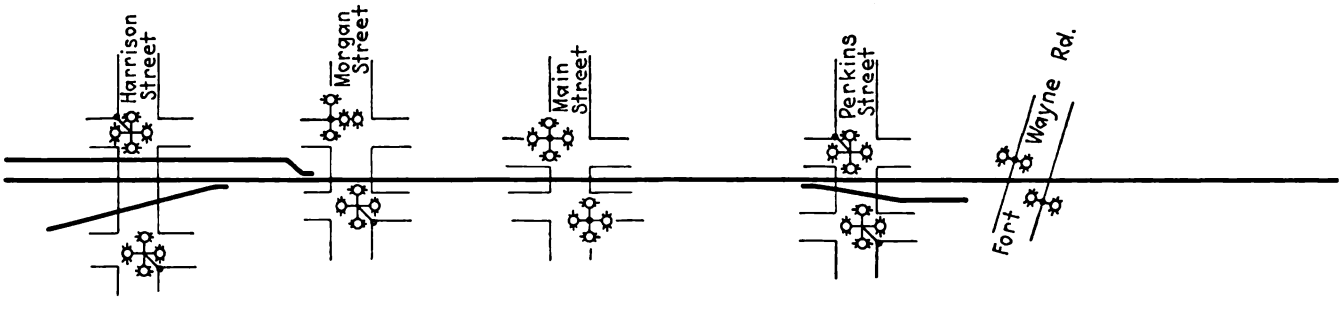


Gate operated by lever stand at Pennsylvania crossing

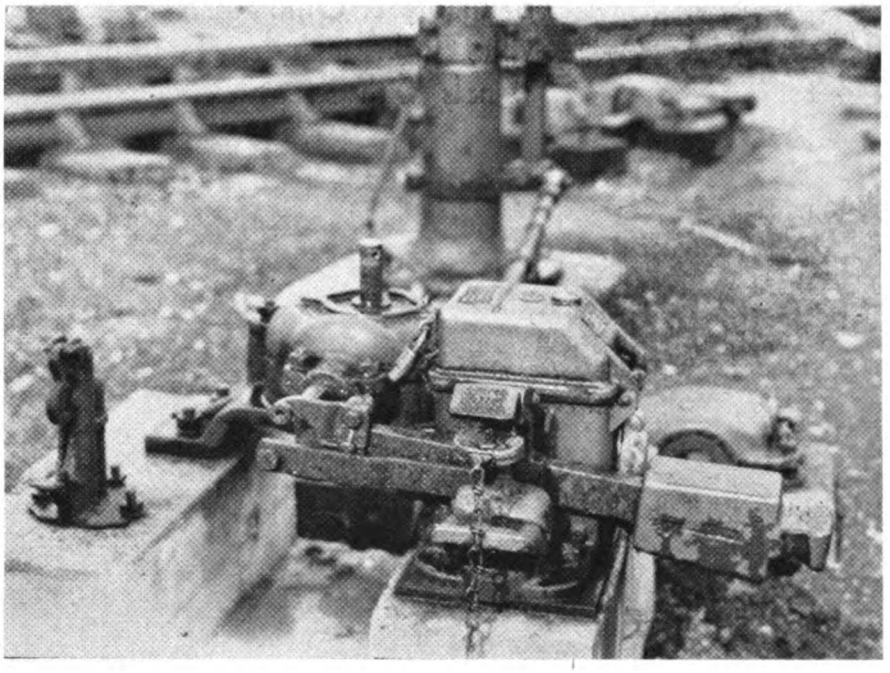
Semi-Automatic Interlocking at Nickel Plate Crossing

A single-track branch line of the Nickel Plate crosses the B. & O. main track and B. & O. siding, 1,163 ft. west of the station. As a part of the recent program, a semi-automatic interlocking was installed at this crossing. All signals normally display the Stop aspect, except Nos. 1 and 2 located on the B. & O. siding. The B. & O. main-track signals are arranged to clear automatically when a train approaches. No approach track circuits are provided on the Nickel Plate or on the B. & O. siding. Signals on the N. K. P. are cleared by push-button control, as will be explained.

The B. & O. siding ends at a main



one railroad crossing and gates at second crossing in Rushville



Electric lock on lever stand for operating gate at railroad crossing

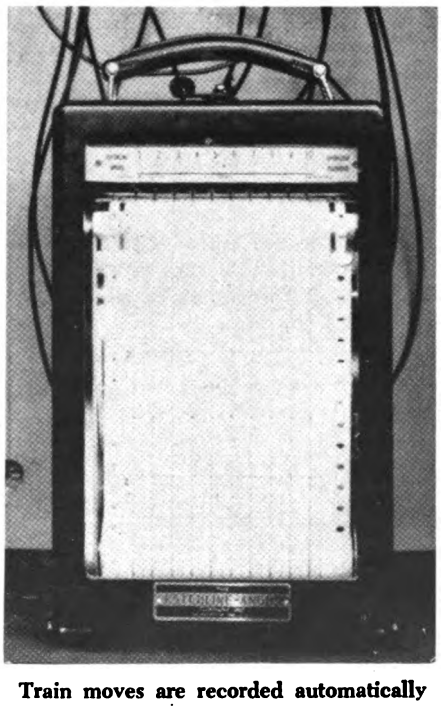
track switch 952 ft. west of the crossing, but within home signal limits. An electric lock was installed on this switch and also on a hand-throw derail at the clearance point of the turnout. About 17 ft. east of the crossing, there is a B. & O. main track switch leading to a house track. This switch also being within home signal limits, an electric lock was installed on the switch and on the hand-throw derail at the clearance point.

On the Nickel Plate south from the crossing, there are two main track switches within home signal limits. No electric locks are required on these switches because the speed of all trains on the Nickel Plate is less than 20 m.p.h. A dwarf signal is located at the right of each of the three tracks to govern movements toward the crossing. Train movements over the crossing on the B. & O. main track are controlled by high home signals. Eastward home signal, is just west of Spencer street, 1,034 ft. west of the crossing. The westward home signal is just east of Arthur street, 547 ft. from the crossing. All of the other signals in the plant are dwarfs.

All home signals normally display the Stop aspect, except signals No. 1 and 2 on the B. & O. siding which normally display Restricting. When a B. & O. train on the main track enters the approach control section, the home signal for that route clears automatically. After the train accepts and passes the signal, it returns to the Stop aspect.

No approach track circuits are provided on the Nickel Plate. An approaching train on this road stops at the home signal. The conductor or trainman goes to the signal and observes an approach indicator, which displays red if a B. & O. train is approaching, or green if no B. & O. train is approaching. If the "green" is displayed, the Nickel Plate man pushes a button which sets the B. & O. signals on the siding at Stop, holds the B. & O. main track signals at Stop, and starts a time-element relay. When 1 minute has elapsed, the Nickel Plate signal clears.

If a B. & O. freight train is holding the main track approach section while switching, and the Nickel Plate has a train to cross, the N. K. P. trainman goes to the crossing and, with permission of B. & O. dispatcher, operates a master button. This sets all B. & O. signals at Stop. After 5 minutes, the Nickel Plate signal clears. Push buttons with special circuits are provided for the use of B. & O. trainmen to cause signals to display Restricting, for moving engine back on train after switch movement is made through the interlocking. A 10-pen Esterline-Angus recorder makes a record of the occupancy of track circuits and the operation of all home signals.



Train moves are recorded automatically

Street Crossing Signals

The flashing-light signals at the eight street crossings are controlled automatically by track circuits in the conventional manner, the lengths of the control sections being based on maximum time table allowable speeds. Special control circuits are arranged so that the flashing-light signals at Spencer street do not operate until adjacent home signal has cleared for an approaching train. This avoids delays to street traffic if the train is to stop at the signal.

For several city blocks, in Rushville, the Baltimore & Ohio main track is located down the center of a street, with a driveway on both sides of the track. At most of the crossings, the driveways are so close to the track that there was no place between the track and the drive to locate flashing-light signals. Therefore, at several crossings, the flashing-light signals are mounted on bracket arms on 8-in. masts, the foundations of which are located on the parkway, and are thus the width of the drive away from the track. On each bracket arm, there is a set of flashing-light signals for the north-and-south street that crosses the track, and also a set of flashing-light signals for the east-and-west driveway, parallel to the track. The bracket arm extends at an angle of 45 deg. from the line of curb which locates the two sets of flashing-light signals where they are readily seen by drivers of approaching street vehicles and as close to the track as was possible. Standard clearance from the pavement to the bottom of the bracket arm is provided.

This signaling and interlocking project was planned and installed by Baltimore & Ohio forces, the major items of signaling equipment being furnished by the General Railway Signal Company.