Automatic Interlocker Protects Gauntlet Track

Installation pays for itself in less than one year — Simplicity of design and low maintenance costs are distinguishing features

A STRIKING example of the substantial economies effected by automatic interlockers is afforded by the Baltimore & Ohio Chicago Terminal in their recent installation of automatically interlocked signals protecting train movements through the gauntlet bridge across the Grand Calumet river, near Hammond, Ind.

The line in question is a double-track freight route connecting various freight terminals and classification yards south and west of Chicago. The Grand Calumet river is crossed just west of the Indiana boundary line, between State Line interlocking on the east and Calumet Park interlocking on the west. "State Line bridge," as it is commonly called, was originally a swing bridge operated by a team of horses. In 1912, the river traffic having been diverted to other channels, the bridge was locked permanently for rail traffic. Except in emergency

The gauntlet extends over the bridge

cases, the traffic consists entirely of freight trains, there being about 20 such trains each 24 hours.

Until recently there has been a single track over the bridge, with hand-thrown switches at each end tended by three switchtenders, one on each trick, who were on duty continuously to aline the switches and to flag trains across the bridge.

The bridge is of sufficient width to carry two tracks, but, because of its design and age, it does not have sufficient strength to carry double-track loading; even under present operation, double-headers are not allowed on the bridge, and a slow order restricts the maximum speed to 20 m. p. h. Therefore, the logical plan was to install a gauntlet track, with automatically interlocked signals affording the needed protection. This installation,

The dwarf signals are fixed in the stop position

which was placed in service on July 23, 1930, not only handles the traffic with greater safety and fewer delays, but also demonstrated its economic justification in no uncertain manner.

Savings Accomplished

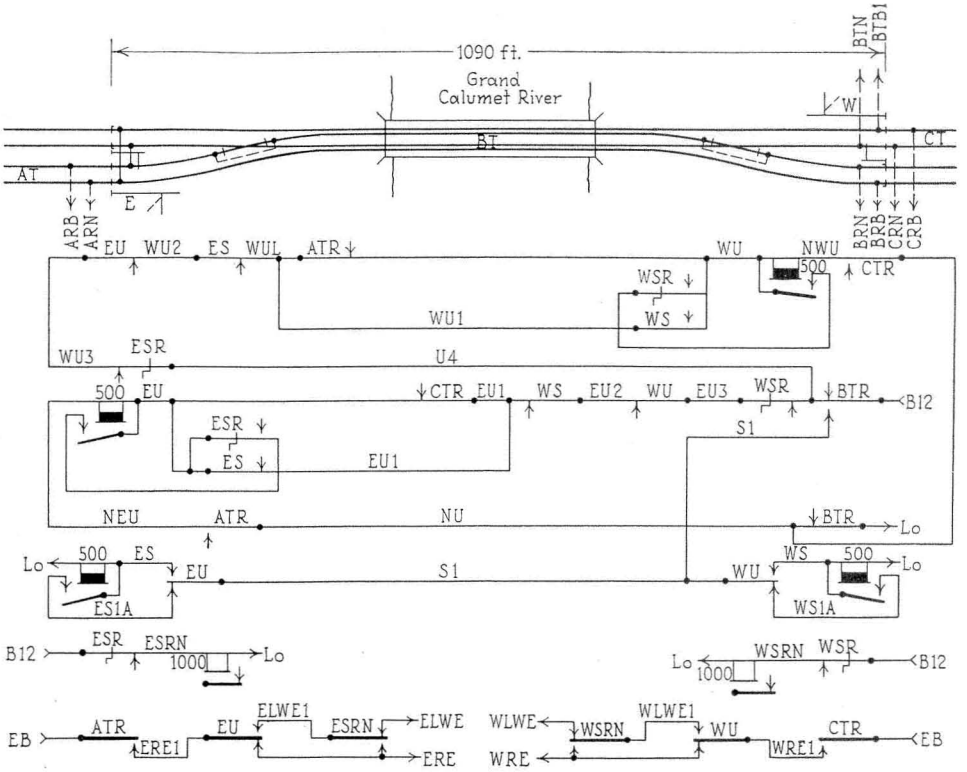
The cost of the installation was approximately $2,800, including labor and materials. The operating expenses include a charge of $4.50 to $4.90 a month for electric power, and approximately one hour each day of the signal maintainer's time, there having been no increase, by reason of this installation, in either the signal maintenance force or the maintainer's working time. The services of the three switchtenders formerly employed have been discontinued, the saving therefrom amounting to $5,551.65 a year. Lesser savings have resulted from the removal of switches and switch stands, but the major figures indicate that the plant will pay for itself in less than one year.

Construction Features

The installation is entirely isolated from the neighboring interlocking plants, and there are no automatic signals on this line. There are no distant signals, but fixed markers indicate the approach to the gauntlet. Two-position high signals are used for normal-direction traffic, while fixed-stop dwarf signals govern back-up moves through the gauntlet. The signals are the color-position-light type.

The high signals display red for Stop and lunar white for Proceed. The latter aspect is the Baltimore & Ohio standard for a signal whose Proceed aspect is to be distinguished from the Caution indication of an automatic, or semi-automatic, signal, where a yellow aspect indicates that the route is clear to the next signal governing traffic in the same direction. In the case of the dwarf signals, only the red aspect is displayed, the remaining units being blank.

Foundations for the high signals were poured in place, while those for the dwarf signals were pre-cast in the Baltimore & Ohio shops at Zanesville, Ohio. A considerable portion of the high signal mast is left projecting above the signal unit to provide for the installation of a top marker unit if, later on, it should be de-



Written circuit plan

cided to incorporate this plant into a continuous automatic signal system.

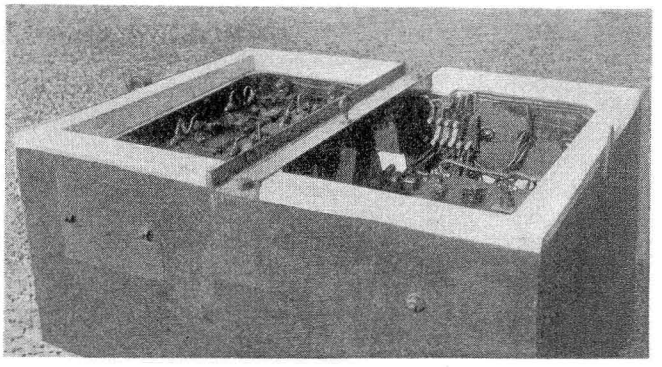
Parkway cable is used for the frog jumpers, with Railroad Accessories Corporation bootlegs, and for the high-signal lighting circuits where this signal is located across the track from the relay case; the other lighting circuits and rail connections are carried in trunking. The cable is protected at the ground line by a two-foot piece of wrought-iron pipe sealed with pitch, and is run to the signal head on the outside of the signal mast. Relays and power-control equipment are housed in wooden relay cases having double storm-doors.

Alternating current is used for the 13.5-volt 17-watt signal lamps at their rated voltage, with a power-transfer relay arranged to transfer the load, in an emergency, to the storage battery which is used for the d-c. control circuits. The high signals are approach-lighted, the dwarf signals continuously lighted.

Operation

Electric power, at 110 volts, 60 cycles, is obtained from a nearby power main. At each of the two signal locations there is a storage battery consisting of six Exide Type EMG07 cells, which is on a-c. floating charge through a Type C-1 Fansteel rectifier cell, and which is housed in a concrete battery box. The single series gauntlet track circuit is fed by one cell of the same type. Each of the normal-direction approach track circuits is approximately 1,500 ft. long and is fed by three cells of Waterbury 500—a. h. primary battery. Since the back-up signals are fixed, no approach track circuits were needed for them. Open-line construction, with aerial-cable pole drops, carry the signal control circuits and power line. A time release, adjusted to a time interval of one minute, is housed in a switch padlocked box attached to each of the two instrument cases.

High signals are automatically cleared on the approach of a train. The dwarf signals, governing abnormal moves, are fixed in the Stop position; a train crossing the bridge against the current of traffic is compelled to stop at the dwarf signal and then proceed under flag protection.



Storage batteries assure continuity of operation

In case two normal-direction trains, approaching the gauntlet from opposite directions, enter the approach track circuits simultaneously, neither high signal will clear and one of the time releases must be operated.

The plant was designed under the direction of G. H. Dryden, signal engineer, and installed by a crew of four men in charge of a leading signalman who reported to C. O. Seifert, supervisor of signals. As stated, no increase in the regular signal maintenance force was necessitated by the installation of this plant. Practically the only maintenance work consists of renewing the approach track circuit primary batteries approximately every four months; renewing the signal lamps on a bases of 1,000 hours of burning time; inspecting rail bonds, insulated rail joints, etc.; cleaning the signal cover glasses; and painting as required.