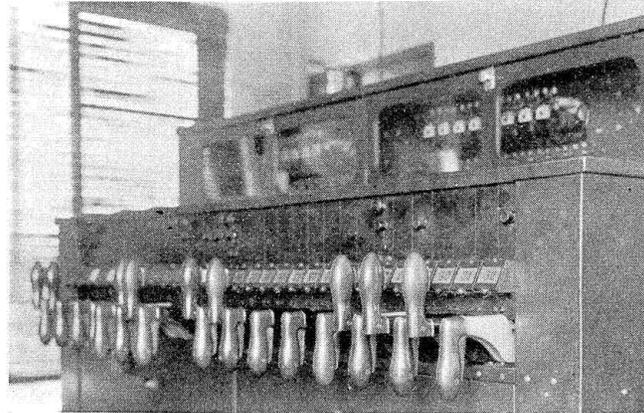


# Electric Interlocking on Staten Island Lines of the Baltimore & Ohio

Replacing mechanical plant facilitates operation at congested junction on suburban line



The interlocking machine is housed in a sheet-metal case and is equipped with modern devices

**A**N electric interlocking has been installed to replace a mechanical plant at Clifton Junction on the Staten Island lines of the Baltimore & Ohio. From St. George, the main terminal of the Staten Island lines, double-track extends 1.9 miles to Clifton Junction, from which point double track extends 2.2 miles to South Beach and a double-track line, branching off at Clifton Junction, extends 12.6 miles to Tottenville on the south end of the island. A 20-lever mechanical plant had been in service at this junction for years. When the tracks in this vicinity were elevated to permit Bay street to pass under, the track layout was changed and the junction switches moved. It was, therefore, necessary to replace the old mechanical plant, and, in view of the heavy traffic, it was decided to install a modern electric interlocking at this junction. A point in favor of installing an electric plant was that it could include a crossover and a switch leading to an enginehouse east of the junction, which had previously been handled by hand-throw switches.

## Traffic Conditions

The passenger train service on this line consists entirely of local suburban business handled by multiple-unit cars operated by electric propulsion, using a third rail. Trains are operated on 15-min. headway each way for both the South Beach and the Tottenville lines so that there are two trains in each direction every 15 min. through the Clifton Junction plant. During the morning and evening rush hours, trains are operated on a 10-min. headway. In addition, as many local freight switching trains are operated as are required by the service, usually two such trains being run in each direction daily. This freight service is operated by steam locomotives, which are housed in an enginehouse just south of the tracks at Clifton Junction. Numerous light-

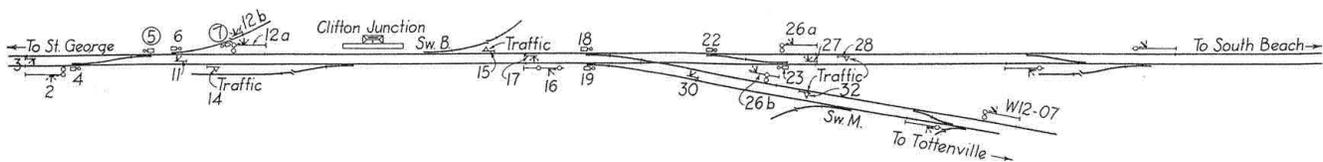
engine movements are, therefore, made between this enginehouse and St. George. In order to handle the multiple-unit trains, the line-up of the plant has to be changed two and sometimes three times every 10 min., while additional line-ups are required for the light-engine moves. Therefore, as this is a very busy plant the installation of power-operated interlocking not only facilitated the operation of the plant but reduced train delays materially.

## Operation of the Plant

As a part of the improvements a new brick passenger station was constructed, and the interlocking machine is located in an operating room on the second floor of this station. The new machine is a 32-lever G. R. S. Model-2 unit, housed in a sheet-metal case. The 26 working levers include 9 levers for 11 signals, 8 levers for two crossovers, three single switches and 1 derail; the remaining 5 are traffic levers. The individual cross-protection relays are located in a cabinet on top of the machine. The 110-volt d-c. switch machines are operated and controlled with the regular dynamic system of indication, but battery indication is used for the signals.

In case a train occupies one of the track circuits controlling an interlocked home signal, the fact is indicated by the illumination of a red lamp located above the lever. If the first track circuit beyond the signal is occupied, and it is desired to display the stop-and-proceed aspect for a follow-up move, the signal lever is reversed and a mechanical-stick pushbutton, mounted above the signal lever, is pushed in. This causes a stick-relay contact to be bridged, thus permitting the stop-and-proceed aspect to be displayed. The button returns to its normal position when the lever is placed normal again.

The five traffic levers are used to establish the direction of traffic on each of the several routes. For ex-



Track and signal plan of interlocking

ample, traffic lever No. 1 is for the establishment of reverse running on the westward track between St. George and Clifton Junction. When this lever is reversed, the distant signal displays the stop-and-proceed indication, and the mechanical locking between this lever and other levers prevents conflicting signals from being cleared.

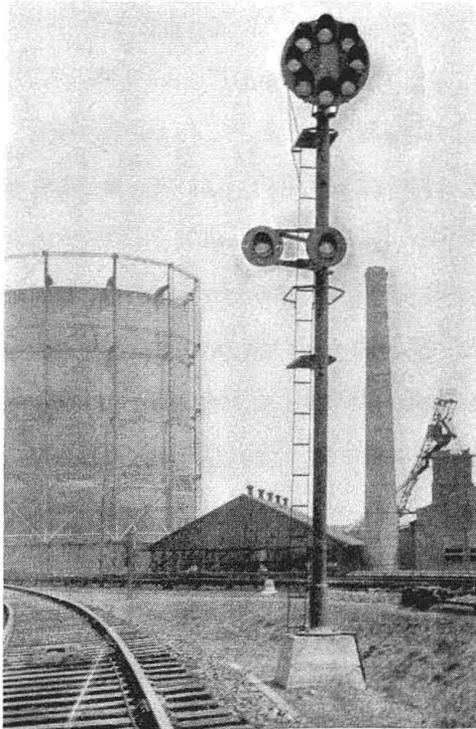
The relay rack, located in a room at the rear of the machine, is made up with a frame of 2 in. by 2 in. angle iron, the asbestos board shelves and terminal boards being attached by  $\frac{1}{4}$ -in. stove bolts. The shelves are  $13\frac{1}{4}$  in. deep, the five bottom shelves being 15 in. high and the top one 20 in. high.

### Type of Equipment

The battery room is on the ground floor under the relay room. The main battery consists of 55 cells of MVSA-7 Ironclad Exide battery, and six cells of the same type are used for the low-voltage control circuits. The main battery is on floating charge by a G. R. S. Type-BP Size 1648 rectifier, and a rectifier of the same type, Size 232, is used to charge the low-voltage battery.

The main wiring distribution from the tower to the junction boxes is in lead-covered cables run in creosoted-wood pump log with a 3 in. inside diameter. After the log is in place, it is covered with a 2 in. by 8 in. treated cover board. A separate two-conductor lead-covered cable is used for the 110-volt a-c. circuit used to feed the light signals.

The signals on this plant are the Baltimore & Ohio standard color-position-light type. Each lamp unit is equipped with a 13.5-volt 17.5-watt lamp, and each set of lamps for an aspect has a separate 110/13.5 volt transformer, the 110-volt feed being controlled through



Color-position-light signals are used

the contacts of the d-c. signal-control relay. On account of the d-c. propulsion, the track circuits are energized by alternating current, using G. R. S. Model-2 a-c. relays.

The switch machines are the Model 5A, equipped for operation on 110-volts d-c., and are provided with point

detectors. The switches are well constructed, using 1-in. by 8-in. insulated gage plates with adjustable rail braces on the tie ahead of the points and on the first two ties under the points. The B. & O. type front rod is



The switch layouts are well braced and equipped with insulated gage plates

used. The switch adjusters are of the Bossert type.

This interlocking was planned and installed by the Baltimore & Ohio forces, the interlocking materials being furnished by the General Railway Signal Company.

## Signals in Detroit

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that there has been no difficulty in controlling the street traffic when trains are approaching. While gates were in service at this location there was an average of 14 accidents each year, in which there were injuries to persons or property, and a number of minor accidents in which the damage was slight. In all of these accidents the gates were broken, incurring additional expense to the railroad company. Since the installation of the signals 16 months ago, no accident of any kind has been reported at this crossing. As a matter of fact, the city authorities are well pleased with the system, two other localities being recently equipped with these signals; negotiations are now under way to make similar installations at other crossings in the city. The installation at Woodward avenue cost about \$3,000, as compared with \$5,250, the approximate annual expense of operating the gates and interlocking plant if they had been retained in service.

The installation was planned and installed by forces of the Detroit Terminal Railroad, under the jurisdiction of H. E. Morris, signal foreman, and W. C. Smith, chief engineer, to whom *Railway Signaling* is indebted for the information in this article.

## B. R. S. of A. Convention

(Continued from page 442)

delegates that no other class of railroad employees were working under such a restrictive and unfair rule as this one.

The entire staff of grand lodge officers was re-elected. Grand President D. W. Helt was granted a leave of absence from his duties as grand president in order to devote his entire time to the duties of board member on the newly created National Board of Adjustment. Assistant to Grand President, A. E. Lyon, was elected Acting Grand President during President Helt's leave of absence.

Chicago was again selected as the Convention City for the 1936 convention. General Chairman of Canadian National Railways, D. Guigue, was selected as delegate to the Trades and Labor Congress of Canada.