The average track circuit is about 4,000 ft. in length, and is operated by two cells of gravity battery connected in multiple. At nearly all of the signal locations the automatic signals are placed directly opposite each other and are operated by a battery of 18 cells, 9 cells being located in the battery section of each signal case. All of the cells are connected in series, 400 ampere-hour Edison cells being used.

The numbers on the number plates are made of enameled iron, are 6 in. high, and are attached to the number plates by means of four ¼-in. bolts. The signal blades throughout the entire installation are painted with imitation gold paint, which is said to be equal to gold leaf.

The mechanical interlocking was installed in accordance with Railway Signal Association specifications for field work, and the construction work was done by the Atlantic Coast Line signal department forces, the mechanical work under the direction of G. F. Partridge, foreman, the electrical work under C. E. Quackenbush, foreman, and the whole installation under the supervision of C. J. Kelloway, signal engineer of the road. The signals and interlocking plants were put in service on December 10, 1910, and the results of their service operation have been very satisfactory.

"R" CABIN INTERLOCKING

One of the most interesting interlocking plants on the Pennsylvania is situated at "R" Cabin, at Brinton, Pa., on the Pittsburgh division. This plant was put in service on May 28, 1905, and contains the first vertical type spring combination electro-pneumatic machine to be installed on the Pittsburgh division. The use of this type of machine, together with the installation of advance and approach

Fig. 1. "R" Cabin, Brinton, Pa.

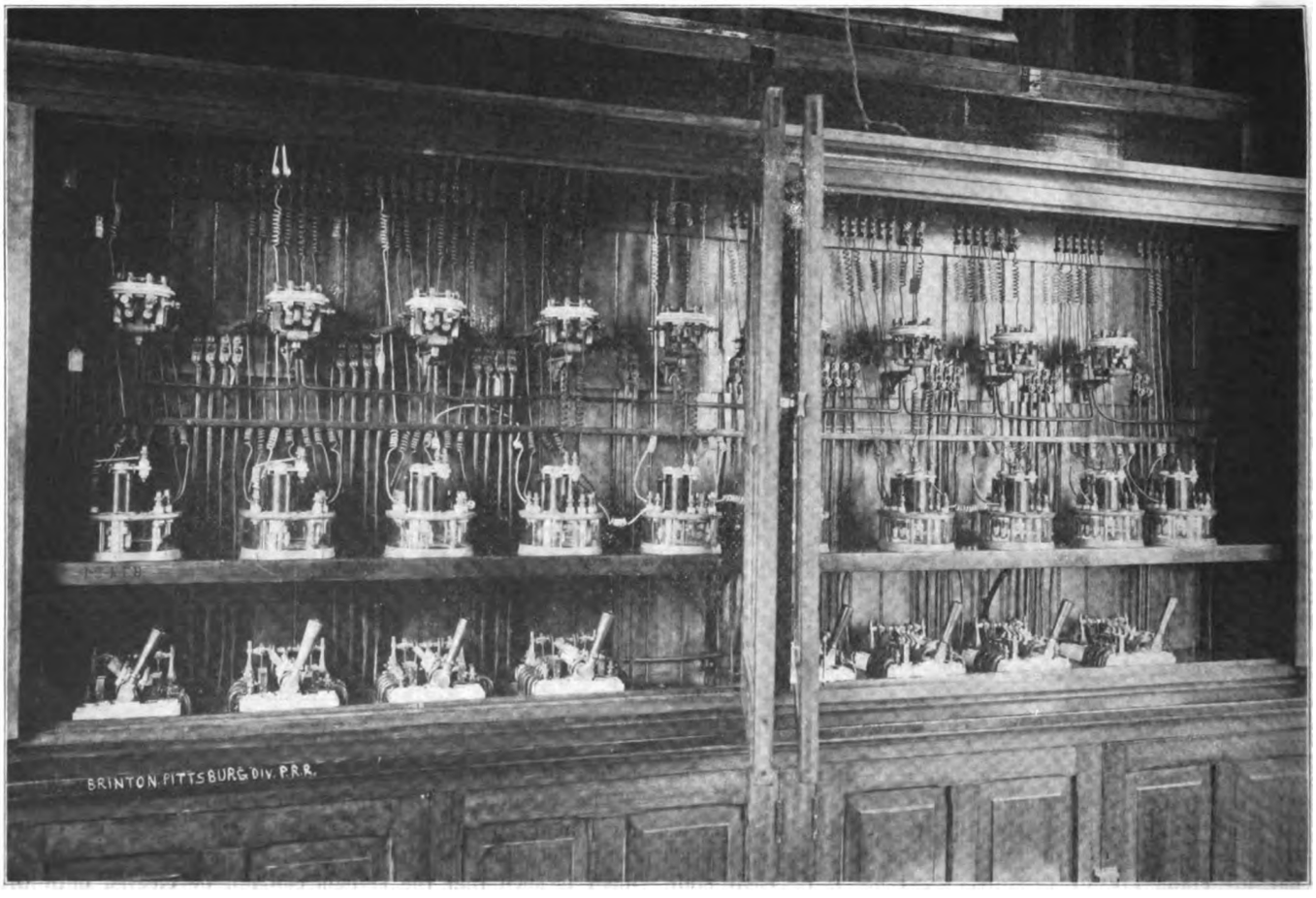


Fig. 2. Relay Case and Methods of Connecting.

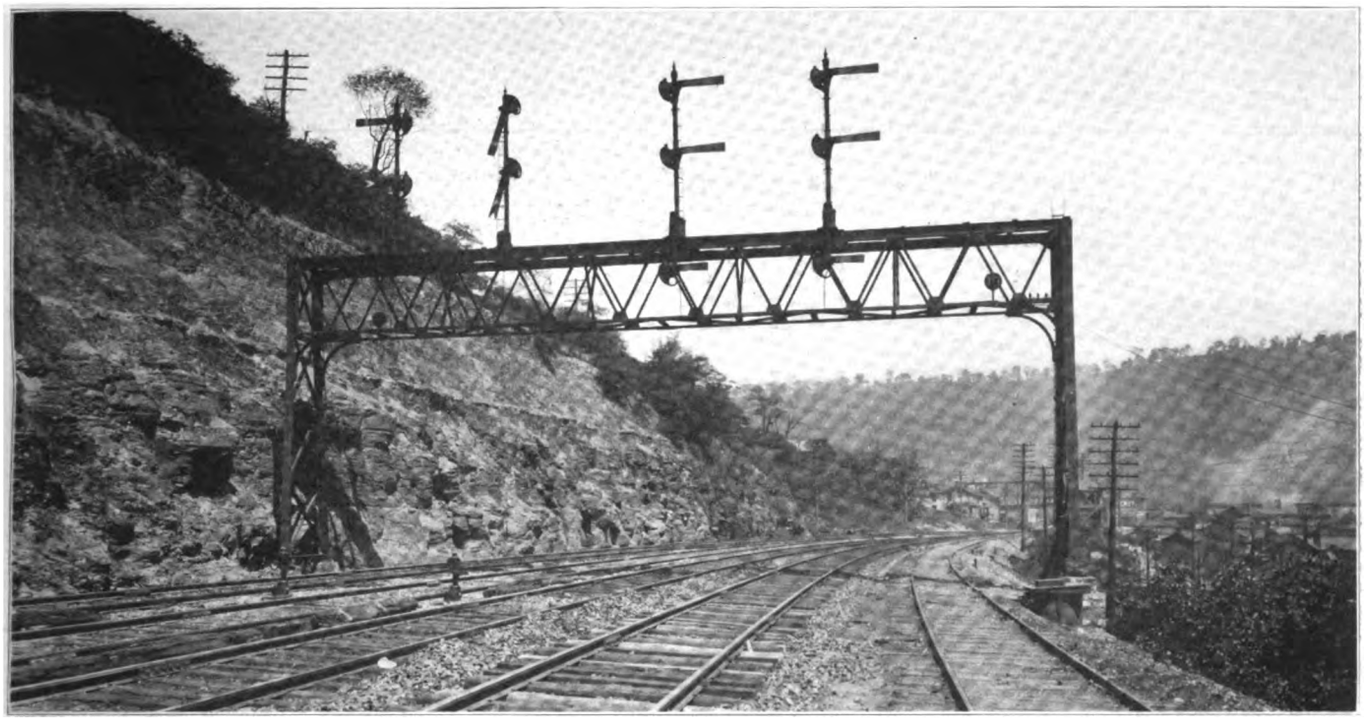


Fig. 3. Signal Bridge. (The Tower may be seen in the background at the right of the picture.)

electric locking were notable departures from previous practice, and, accordingly, the building of the plant was very carefully watched by the officers of the signal department, and great care was exercised, in every detail of its construction. The cabin was designed and built by the forces of the road, and the installation of the various mechanisms, including the interlocking and ground machines which were made by the Union Switch & Signal Co., was done by the signal department. The plant has given excellent results during the six years since it was put in service.

The proper method of construction to follow in order to prevent wire troubles is always a difficult problem for the signal engineer. It must be met and solved at each electric or electro-pneumatic plant he installs, and the successful operation of a power plant generally depends as much upon its proper solution as upon any other construction feature. At Brinton all underground wires were run solid, no joints or splices being permitted, and were enclosed in a wire box and "pitched-in" to protect them from the deteriorating action of moisture. Wires running to relays were brought to a terminal board, from which

Fig. 4. General View of the Interlocking.

No. 16 "office" wires were run directly to the relay connections.

The electro-pneumatic machine consists of a 20-lever frame with 15 working levers and eight spare spaces. Six levers are devoted to signals and nine to switches. Emergency releases were recently added to this machine.

Fig. 1 is a general view of the interlocking showing the type of construction followed; Fig. 2 is a view of the cabin; Fig. 3 shows the interlocking machine surmounted by the track diagram and indicators; Fig. 4 shows the

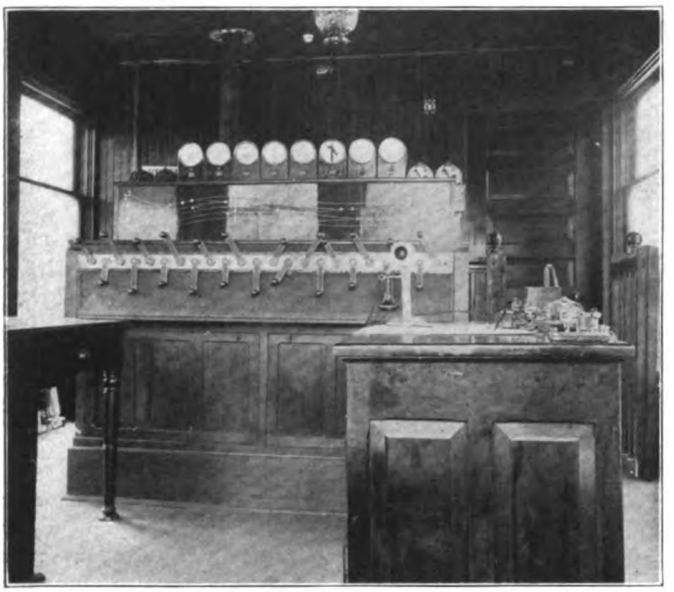


Fig. 5. View of the Interlocking Machine.

relay case and methods of connecting; and Fig 5 is a view of one of the signal bridges.

The plant at Brinton handles 150 scheduled passenger trains each day, and also a vast amount of freight over the main line, as well as to and from the Port Perry Branch.

CROSSING BELLS IN AUTOMATIC TERRITORY

BY A. B. SCHEVE.

A method of operating a crossing bell in automatic block signal territory is shown in Fig. 1. The circuit requires only one additional relay indicated by "T", and the track circuit governing signal 1 is broken through its front contact. A train in the section causes the bell to ring. Sections are generally 2,000 to 2,500 ft. in length. The circuits are very simple,—current

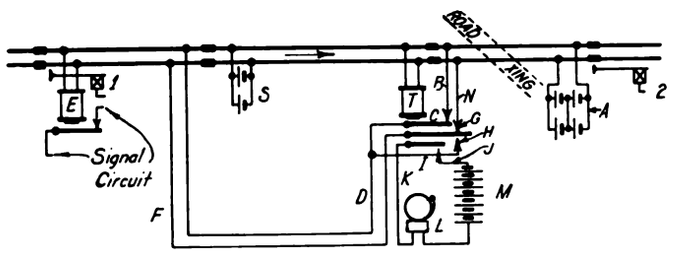


Fig. 1. Crossing Bell Circuit for Automatic Territory.

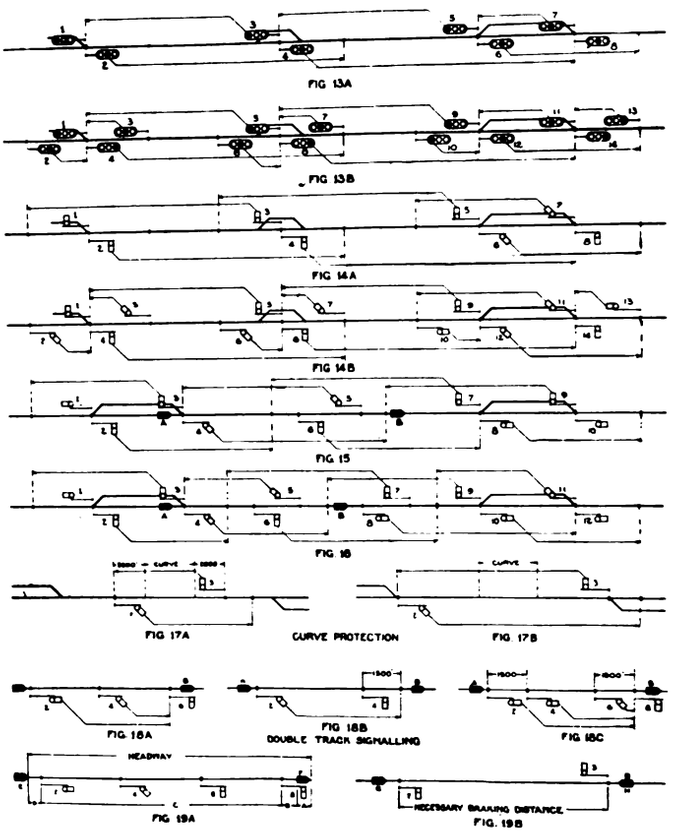
flows through battery A, the rail, wire D, front contact C on relay T, and thence to wire D, the rail, and relay E; and it returns through the rail, wire F, front contact G on relay T, wire N, and the rail, to the negative side of the battery. The track battery S energizes the relay T, and when the section between them is occupied, the armature of relay T is down, breaking the contacts C and G, opening the track circuit, and preventing relay E from picking up. At the same time the back contact J is closed, which causes the bell to ring, and the back contact H is also closed.

THE ABSOLUTE-PERMISSIVE BLOCK SYSTEM

BY W. K. HOWE.

At a meeting of electric railway officers at Syracuse, N. Y., on January 19, W. K. Howe, of the General Railway Signal Co., read a paper on "Automatic Signaling for Electric Railways," describing controlled manual and dispatcher's signal systems and d. c. and a. c. track circuits for automatic signaling. The body of the paper, however, was devoted to a description of the Absolute-Permissive Block system as follows:

Signals, for the purpose of this article, may be divided into two general classes, viz., absolute and permissive. Absolute signals "stop and stay" are those which normally permit but one train in a block at a time except by special permission, such as an order from the dispatchers, or another signal displayed with absolute signals. Permissive signals ("stop and proceed") are those which normally permit trains to follow each other into the same block under certain pre-



Figs. 13a to 19b.

scribed rules. Absolute signals are used to govern the entrances to a piece of single track which of course could not be used by trains in the opposite directions at the same time. Permissive signals are used for following movements.

Figs. 30 to 36, inc., show a series of day and night indications in which an arm in the horizontal position or a red light always means "stop," the arm inclined upward at an angle of 45 deg., or a yellow light displayed above a white light always means "proceed at normal speed prepared to stop at the next signal," and a blade in the vertical position or a green light always means "proceed at normal speed prepared to pass the next signal at normal speed." Furthermore, a yellow light displayed below a white light gives authority to proceed into an occupied block, and is named a "call-on signal" as shown in Figs. 36 and 39.

The white light next below the semaphore is used as a marker and to show whether a signal is absolute or permissive. Lights in a vertical line indicate an absolute signal as shown by Fig. 30, and when staggered, as shown by Fig. 31, indicate a permissive signal.