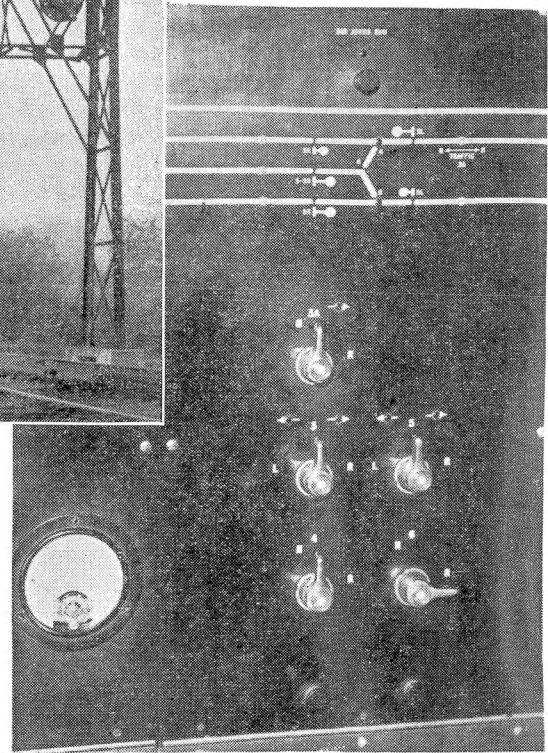


Left—Westward home signal bridge at Sir Johns Run  
Below—The interlocking control panel at Hancock



Four-track to three-track junction at Sir Johns Run, W. Va., controlled from Hancock, saves time for westbound freight trains

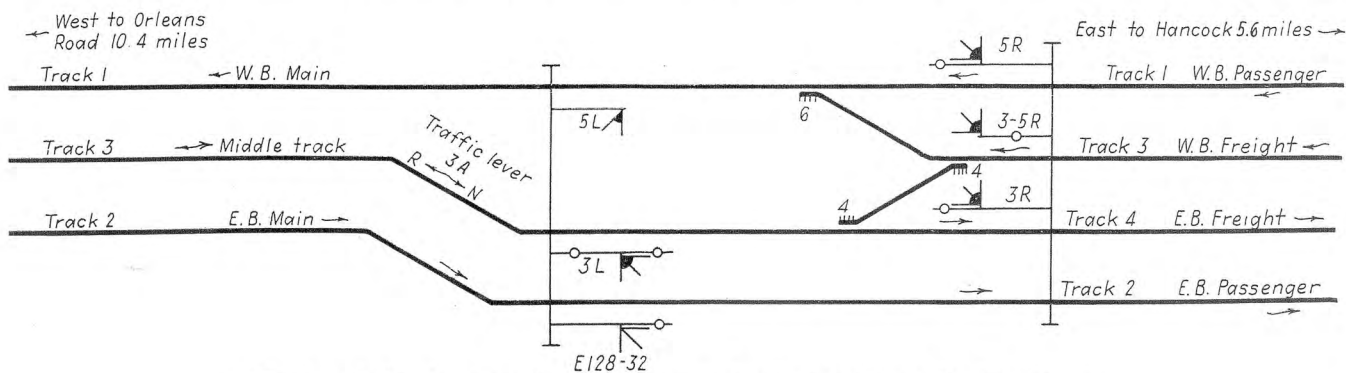
# Remote Control Project Saves Train Time

## on the Baltimore & Ohio

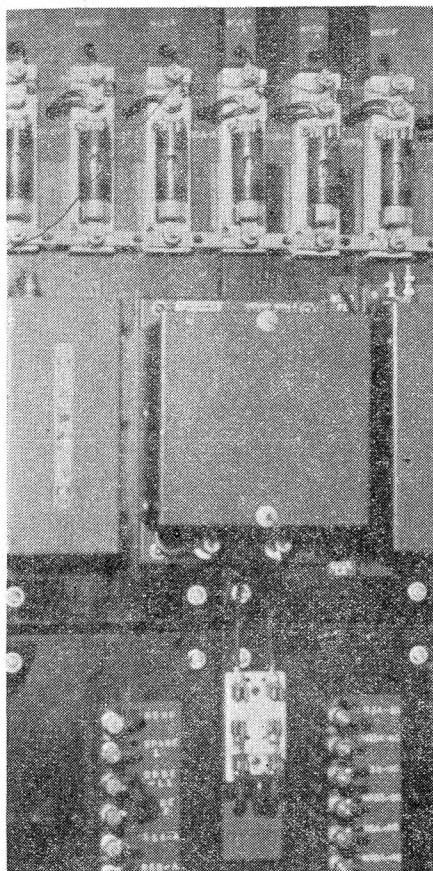
BETWEEN Sir Johns Run, W. Va., and Orleans Road, the Baltimore & Ohio has a 10-mile section of three-track main line, whereas four main tracks are available east of Sir Johns Run, as well as west of Orleans Road. An electro-mechanical interlocking at Orleans Road includes the switches and signals in the junction between the three tracks to the east and the four tracks to the west. There was an electro-mechanical interlocking at the

three-track four-track junction layout at Sir Johns Run until the tower was washed away and interlocking destroyed in the Potomac River flood in 1936. From the time of the flood until the remotely controlled interlocking was placed in service in February, 1944, the switches at Sir Johns Run

were equipped with hand-throw stands operated by train crews. Also during those years the middle track between Orleans Road and Sir Johns Run was designated as the eastward freight track, with the crossover at Sir Johns Run normally positioned for an eastbound freight to be routed



Track and signal plan of the remotely controlled interlocking at Sir Johns Run



Lighting arresters and terminals on panel in the house

from the middle track to track No. 4 east of Sir Johns Run. Switch 6 was normally positioned for through moves on the westward passenger track No. 1. Westbound freight trains on track No. 3 had to stop at Sir Johns Run to permit the head brakeman to throw switch No. 6 for the train to head out on westward track No. 1. After the rear of the train passed, the switch was placed normal by the rear brakeman. If a westbound train used the middle track from Sir Johns Run to Orleans Road, then crossover No. 4 between track No. 3 and the middle track had to be operated by hand. Such a westward move on the middle track was made only on train order. The result was that westbound freight trains lost time when waiting for No. 1 track to be clear of trains, and then lost more time in handling the switches, as well as getting underway from a second stop.

To improve these conditions, it was decided to interlock Sir Johns Run and signal the middle track to Orleans Road for movements in either direction. Three switches and five color-position-light signals at Sir Johns Run are controlled remotely from a C.T.C. panel-type machine located in the tower of a previously-existing electro-mechanical interlocking at Hancock, W. Va., 5.6 miles east of Sir Johns Run.

Referring to the accompanying

track and signal plan, it will be noted that the eastward passenger track, Track No. 2, extends through Sir Johns Run with no switches, and, therefore, this track is not involved, the eastward signal E128-32 being an ordinary automatic block signal.

### Control System

Between the control machine at Hancock and the interlocking layout at Sir Johns Run, the controls and indications are transmitted by the General Railway Signal Company Type-K, Class-M, 10-step time code, using two No. 14 wires in a previously existing aerial cable for the line circuit.

The C.T.C. machine at Hancock, which controls Sir Johns Run, has five levers. One switch lever controls the single switch No. 6, and one switch lever controls the No. 4 crossover. The two signal levers No. 3 and 5 normally stand on center, being thrown to the left to clear eastward signals, or to the right to clear corresponding westward signals. Selections are established by the position of switches. Traffic lever No. 3A is for the middle track and is positioned normal or reversed for eastward or westward traffic respectively.

The illuminated track and signal diagram has lamps which are lighted to indicate the occupancy of each of the track sections within the home signal limits, and each of the five ap-

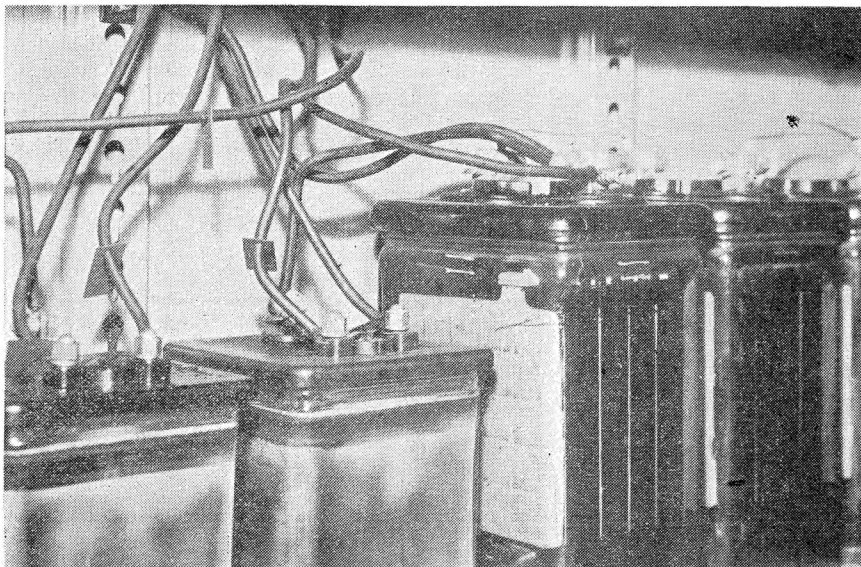
proach sections. Signal-clear indications are displayed by one or the other of two green lights, located above and on either side of the signal lever, the light being illuminated corresponding to the position of the lever and the respecting signal, L or R as the case may be, that is clear in the field. Lamps on the traffic lever indicate traffic reversed on the middle track between Sir Johns Run and Orleans Road.

Switch indication is provided by an out-of-correspondence light located in the barrel of the switch lever. This light is illuminated when the position of the switch in the field is out of correspondence with the position of the switch lever.

A power-off indication light (red) is located on the panel. In event of an a-c. power failure, this light will be illuminated and the buzzer sounded. The operator may acknowledge the indication by pressing a button, thus stopping the sounding of the buzzer, but the red light will remain illuminated until the power is restored to normal.

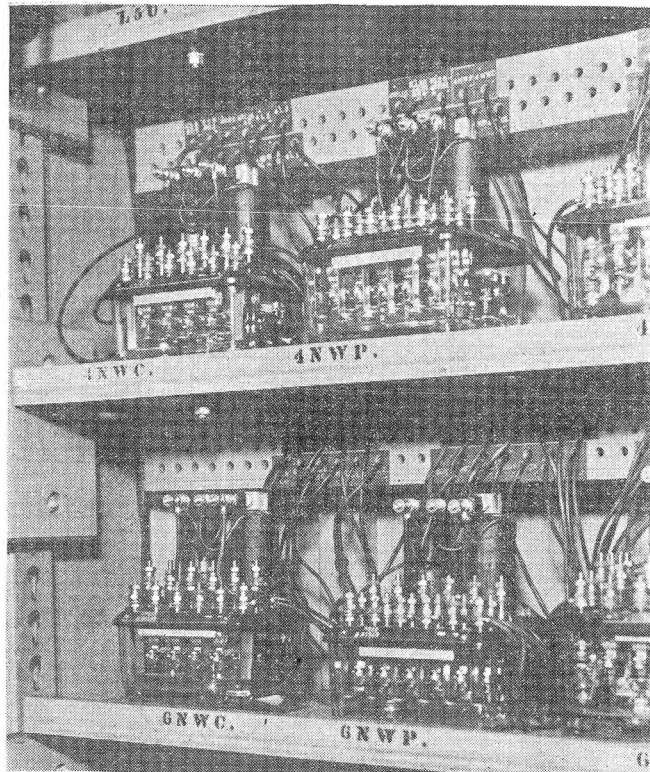
### Either-Direction Signaling Between Orleans Road and Sir Johns Run

Train movements by signal indication in both directions on the middle track between Sir Johns Run and Orleans Road is accomplished by automatic signals and traffic locking. To clear an eastward signal at Orleans Road, the towerman at that location must have traffic lever No. 5 reversed. In order to release No. 5 normal lever lock, the traffic line circuit must receive battery from the Sir Johns Run end. This is done by the operator at Hancock placing traffic lever 3A in the normal position and then transmitting a line code to Sir Johns Run



Switch battery and rectifiers in the house at Sir Johns Run

In the sheet-metal house at Sir Johns Run the relays are on plywood shelves



to energize a relay which feeds battery west on the traffic line circuit. This circuit breaks through front contacts of all the track relays between Sir Johns Run and Orleans Road, so that the station-to-station block must be unoccupied in order to change the direction of traffic. To establish direction of traffic from east to west, Hancock codes lever 3A reversed; Orleans Road places lever 5 normal and operates a push button.

The intermediate automatic block signals were installed about 2 miles apart on the middle track between Sir Johns Run and Orleans Road. One two-wire A.P.B. polarized line circuit is used for the control of eastward signals and another similar circuit for westward signals.

The signals are the Model-2A with d-c. motors rated at 10 volts. These had been in service previously at other locations on the Baltimore & Ohio and were re-installed on this project as a war conservation measure. The signals are equipped with electric lamps rated at 13.5 volts 0.25 amp., continuously lighted.

#### Relays Mounted Above High Water

In this territory, the railroad is in the valley of the Potomac river. To minimize damage during floods, the relays, rectifiers, etc., at signal bridges were located in cases mounted at the same level as the signals. The 8-ft. by 10-ft. sheet-metal instrument house at Sir Johns Run was located on the hillside about 25 ft. higher than the rails.

The relays, other than the code equipment, are Type-K, shelf type, equipped with spring mountings to absorb vibration. The shelves are made of plywood,  $\frac{3}{4}$ -in. thick and about 12-in. wide. The wires coming into the house are terminated on terminals or arresters, as shown in one of the illustrations. From these terminals, flexible insulated conductors extend directly to the terminals of the relays or other equipment. At the rear of the shelves, the wires are enclosed in square chases made of  $\frac{1}{2}$ -in. plywood with small holes each large enough for one wire to extend to its terminal on a relay. The wire chases are at the rear of each shelf

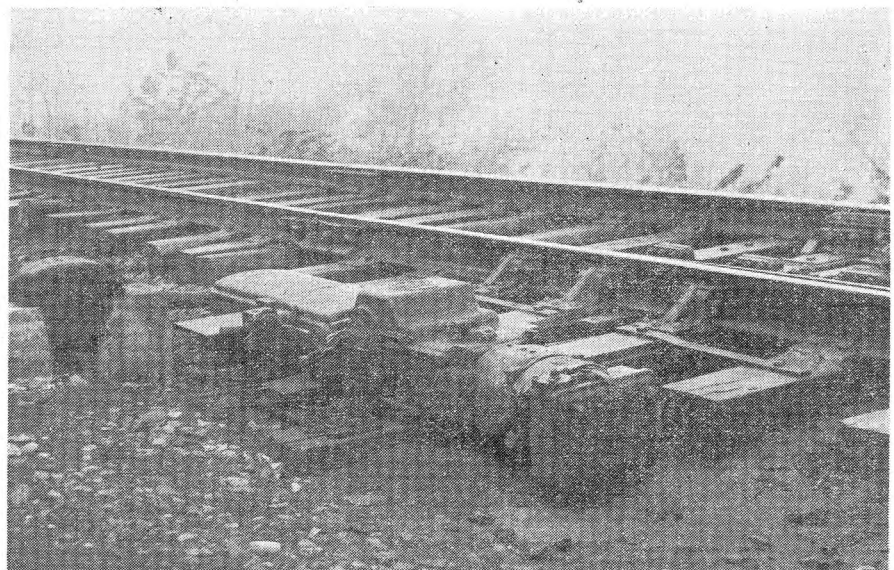
compartment, and access to the wires is gained by raising a board 3-in. wide which forms a part of the rear portion of the shelf above.

Alternating current at 60-cycle single-phase, 460 volts is distributed over the territory by a two wire circuit on the pole line. The current is stepped down to 110 volts at the crossarm and low-voltage transformers feed the signal lamps and operate G.R.S. copper oxide or Balkite rectifiers for charging the storage batteries which are of Exide manufacture. At the Hancock control office, the code line is fed by a set of 30 CTMP-3 cells. A set of 12 DMGP-3 cells, operates the office code equipment. At Sir Johns Run, there is a set of 14 EM-9 cells, the whole of which is used to operate the switch machines, a 24-volt tap operating the field code equipment. Another set of six EM-7 cells is used to feed the standard relay circuits. At each intermediate signal there is a set of six EM-7 cells. Each track circuit is fed by one EM-7 cell.

#### Train Time Saved

Approximately 100 trains move through Sir Johns Run each day. During the month before the remote control interlocking and signaling on the middle track were placed in service, westbound freight trains took an average of 1 hr. 42 min. between Hancock and Orleans Road. After the new interlocking and signaling were placed in service, the average time was reduced to 1 hr. 12 min., a saving of 30 min. per train.

These facilities were planned and installed by signal forces of the Baltimore & Ohio, the major items of equipment being furnished by the General Railway Signal Company.



The power switch machines are the dual-control type