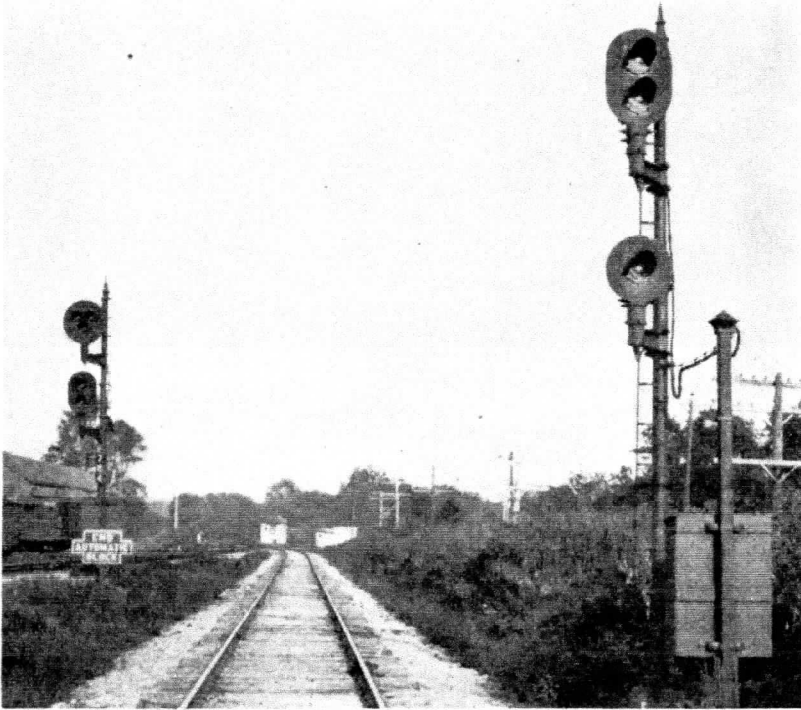


# Railway Signaling



*Eastbound home signal on G. T. W.*

## Remotely-Controlled Interlocking Reduces Operating Costs

*Michigan Central replaces mechanical plant at crossing—Annual saving of \$5,000.00 in operating expenses*

By R. L. Davis

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**R**EMOTELY-CONTROLLED signals electrically interlocked have been installed at a crossing of the Michigan Central and the Grand Trunk Western at Rochester Jct., Mich., to replace a ten-lever mechanical plant. The control of the new installation is located in an existing tower at Main street, Rochester, one mile away, so that the levermen previously required at Rochester Jct. were relieved. This effected a saving of approximately \$5,000 annually, which is equivalent to about 28 per cent on the expenditure for the new facilities.

The Michigan Central line involved in this crossing is single track and is a portion of the main line from Detroit to Bay City, handling 6 passenger trains, 10 freight trains and two mixed trains daily. The Grand Trunk Western line over this crossing is likewise single track and is a part of the branch line between Pontiac, Mich., and Richmond and handles two passenger trains and two freight trains daily. An interchange track connects the two lines, the switch on the M. C. being inside the

home signal limits and that on the G. T. W. about ten feet outside the home signal limits.

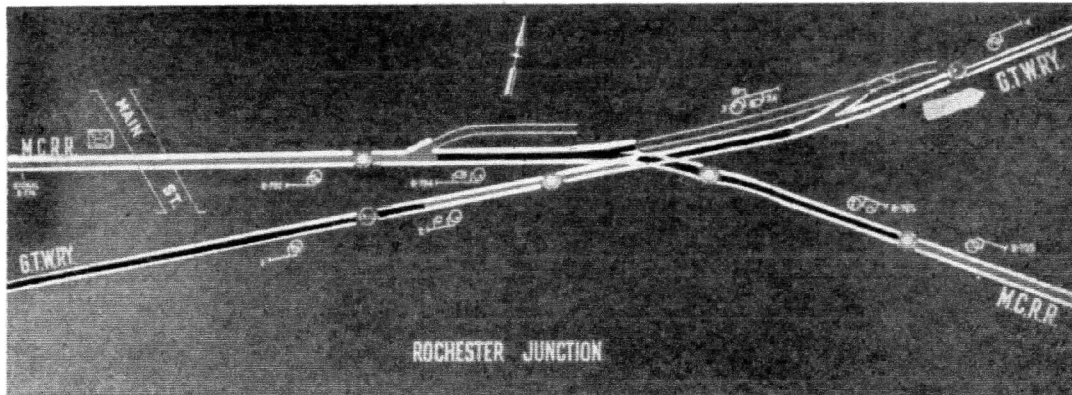
The control equipment for Rochester Jct., is located in the interlocking tower at Main street and consists of an illuminated diagram, a set of push buttons with indicating lights, located at the operator's desk, and a lever in the interlocking machine which is not interlocked with the other levers but is used to select between different manual block indications of signal B784.

Typical operation for a southbound M. C. train is as follows: When the train enters the approach section an annunciator bell rings and the light in the corresponding section of the diagram is illuminated. If the plant is unoccupied, and the towerman is ready to let the train go through, he pushes the top button, on the box at his desk, marked M. C., as shown in the illustration. This action causes the top unit of signal B784 to change to the proceed indication, which fact is indicated by the lamp, behind the red lens on the box with the button, being extinguished. This lamp remains dark

until the train passes the signal. If the train had been approaching from the opposite direction, the towerman would have pushed the same button, the proper signal being cleared automatically for the direction in which the train is approaching. Similar operation is effective

southbound trains at the southward home signal, B784, it will be noted that the top unit has three indications. The third indication was necessary because the signal is used also as a manual block signal.

The selection between the different manual block indi-

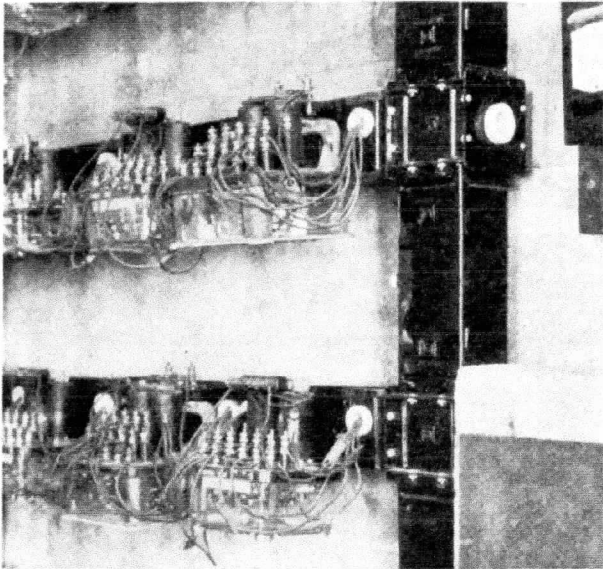
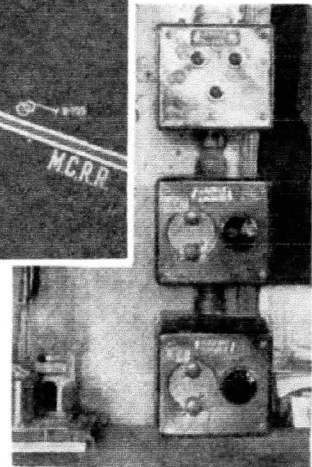


for the through movement of G. T. W. trains using the buttons on the box marked G. T. W.

It will be noticed that the southward home signal on the M. C., No. B784, and the westbound home signal on the G. T. W., No. 3, have each an additional two-position unit, the red light of which is displayed as a marker in conjunction with any indication of the top unit and the yellow light is used for a purpose of special interest: When a G. T. W. eastbound freight has some

Above — Illuminated track diagram on tower wall

Right—Control buttons and light on operator's desk



Relays mounted on square conduit

cars to be exchanged with the M. C., the usual move is to leave a part of the train standing on the approach section. The engine then goes forward and places the cars on the interchange track, but in doing so, it passes out of the plant limits and releases the crossing. The yellow indication of the lower unit of signal No. 3 was provided to enable the engine or a portion of the train to return to the portion left behind. The yellow indication is given only when a separate button is pushed by the operator, and then only when the approach sections at both ends of the plant are occupied. The yellow indication of the lower unit of M. C. signal B784 is similarly used and controlled.

Although the automatic block on the M. C. ends for

cations is controlled by a lever in the mechanical interlocking machine to which a set of circuit controllers is connected. With the lever normal, the signal will display the stop indication; if latched in the mid-position the yellow indication will be displayed; and if latched in the reverse position the green indication will be displayed. However, in each case the actual clearing of the signal is controlled by operation of the button on the operator's desk, as explained before, and the operator has full control of all the indications displayed. As a check on the proper signal indication being displayed, red, yellow and green repeater lights are mounted in the top box at the operator's desk. The repeater lights will function only when the corresponding light indications are actually displayed at the signal. This control of repeater lights is effected through relays in series with the signal lamp filaments.

When a train is stopped at any of the home signals, and the signal does not immediately clear, the conductor or engineman goes to a booth at the crossing. Inside the booth is a telephone connected with the Main street tower, a clock-work time release, a framed set of instructions and an illuminated track diagram. If the cause of the delay is not apparent from the indications on the diagram, the towerman at Main street is called. If the towerman is not holding the signal at stop, then, on consent of the towerman, the time release may be operated. The time release requires four minutes to run down after which the towerman can give the train a proceed indication providing all circuits, including the track circuit, are functioning properly. The time release is provided primarily for use after a route may have been set up, through error or misunderstanding, for a train which did not run through the plant.

### Construction

A concrete house 6 ft. by 8 ft., located at the crossing, houses the transformers, rectifiers, batteries, and relays for the plant. Seventeen conductors are used between the concrete house and the tower at Main street.

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*(Continued from page 430)*

A storage battery of 14 cells of Edison Type A 12H is used for control circuits and emergency supply for the signals which are normally lighted on alternating current. The d-c. track circuits are fed by storage cells on a-c. floating charge. A detail of interest in connection with the telephone booth is a switch, controlled by the latch on the door, which prevents the lights on the illuminated diagram from burning except when the booth is in use.

A new and unique method was employed for the mounting of the relays in the concrete house, as well as those located in the Main street tower. A framework is constructed of sections of standard square duct 4 in. square in cross-section. The wall-mounted type relays are attached to the duct and the wires from the relay posts enter holes in the duct through insulated bushings. The top of the duct is hinged to swing up so as to facilitate the installation and inspection of the wires.