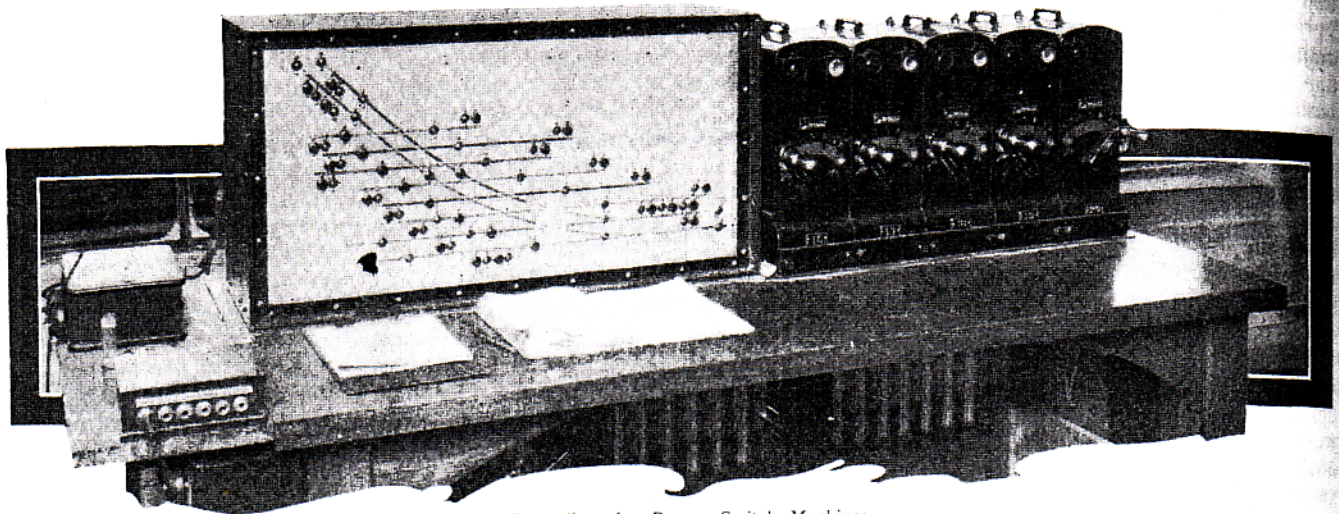


# Michigan Central Installs Simplified Electric Interlocker

*Push-button control for signals, and desk levers for power switches effect economy in new plant at Detroit*



*Push-Button Signal Control Diagram and Table-Lever Controllers for Power Switch Machines*

**A**N innovation in the electric control of interlocked color-light signals and power switches is found in a new electric plant recently completed by the Michigan Central at Belt Line Junction, Detroit, Mich., to replace a mechanical interlocker. The most noteworthy feature of the new plant is a combination push-button signal control machine and track diagram, whereby the color-light signals are controlled by means of push-buttons located on this diagram to correspond with the respective locations of the signals in the plant. Adjoining this control panel is a five-lever G-R-S table interlocker for controlling six power-operated switch machines and for the selection of traffic as between the Michigan Central and the Grand Trunk Western, the other road involved in the plant.

A feature of the plant is the absence of derails. The high signals, of which there are three, are triangular type color-light signals, employing 18-watt, 10-volt lamps. The dwarf signals are the searchlight type, using two indications (red and yellow) except for the two Grand Trunk Western main-line tracks, where the signal aspects displayed are red and green. The power switch machines, the color-light signals, desk-lever units, and other related equipment were furnished by the General Railway Signal Company.

The plant handles the Michigan Central freight trains for the Belt Line, which serves most of the industries at Detroit, and also the Michigan Central's passenger and freight traffic between Detroit and Bay City. The Grand Trunk Western has six tracks in this plant, all of which are crossed by the double-track Belt Line connection. However, no interchange movements between the two roads are made at this plant.

## Signal Control Diagram and Table Levers

A three-story brick and concrete building has been provided for the control facilities as well as for a branch

yard office and switchman's headquarters. The top floor is used jointly by the yardmaster and the towerman. The signal control panel, the five table-lever controllers and the relay racks for all of the control relays in the tower, are located in this room. The push-button control machine for the signals resembles the illuminated track diagram commonly used at interlocking plants. However, in addition to the usual indicating lamps, a number of Western Electric push buttons are mounted on this panel. Reference to the track and signal drawing will show that a push button is mounted adjacent to a red switchboard lamp to represent each of the dwarf and high signals in the plant. In addition, track circuit repeating lamps are placed near the center of each track section. There is also a push button in each track section for the purpose of changing a route in the event that it is found necessary to do so before the signal is accepted by a train. The red signal lamps are normally lighted, because the red signal unit is the one normally operated. The track circuit repeating lamps, however, are lighted only when a train enters the track section.

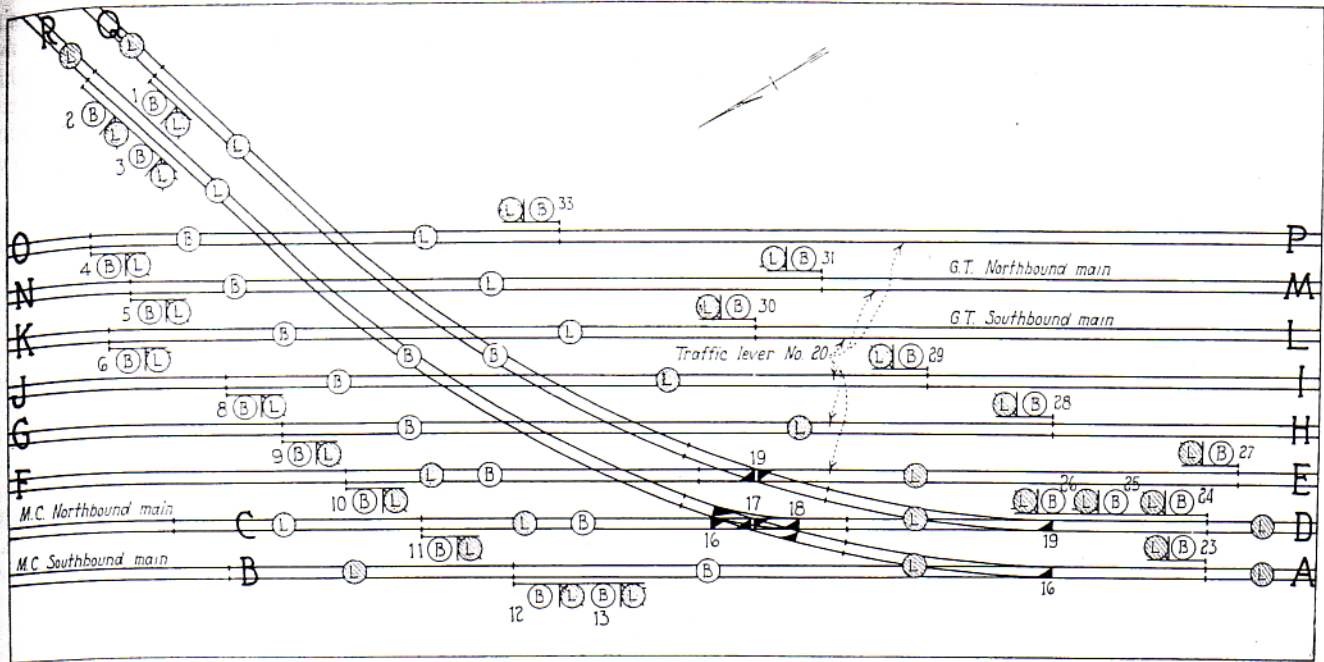
The five-lever G-R-S table interlocker is mounted on the same table as the signal control panel. The four units controlling the six power switches are provided with high-voltage "snap" contacts for the 110-volt motor circuits. Each unit is provided with normal and reverse indicating positions. There is also an electric route lock on each switch machine lever. A red indicating lamp in the upper left corner of each unit informs the leverman when the switch machine has unlocked and is being operated to the reverse position, this lamp being energized only during the operating cycle. The fifth table-lever unit, the one at the extreme right, is a traffic control lever for interlocking the control of train movements northbound and southbound on the six Grand Trunk Western tracks with the diverging Belt Line train movements of the Michigan Central. The five table-lever

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Track and Signaling Plan of Belt Line Junction Interlocker, Detroit, Mich.

units are mounted on a common mechanical locking bed: thus the usual preliminary mechanical interlocking features found in all plants are provided in this case.

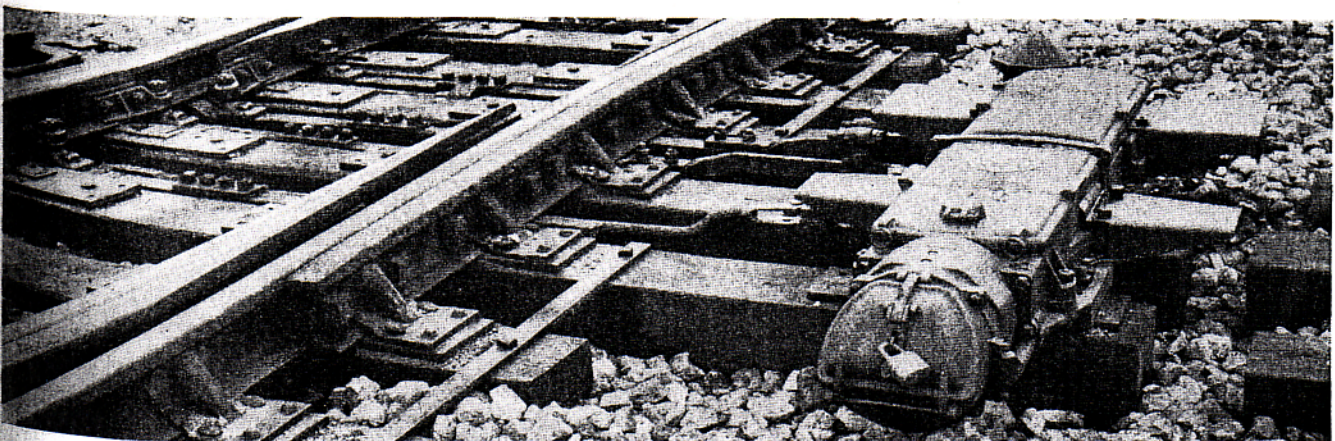
### Power Supply Facilities

The power supply facilities are located in the basement of the tower. A 55-cell Exide Ironclad storage battery furnishes energy for the operation of the 110-volt power switch machines. Union electronic rectifiers for charging these batteries are also located in this room. Owing to the use of a sealed jar storage battery, no acid spray or destructive corrosion is experienced and hence the charging equipment is located in the battery room with an attendant saving in space.

An example of the mechanical interlocking will be given. For instance, traffic lever 20, when moved to the right, will permit northbound and southbound movements on the G. T. W. tracks. On the other hand, when lever 20 is moved to the left it is possible to reverse switches 18 and 19 for a diverging movement over the Belt Line. In other words, when traffic lever 20 is in the extreme right position, the Michigan Central switches 18 and 19 are locked in their normal position by traffic lever 20; also when lever 20 is in the extreme left posi-

tion, the reversal of switches 18 and 19 locks traffic lever 20 in the extreme left position.

Assuming that traffic lever 20 is in the extreme right position, the northbound dwarf signal 31 on the Grand Trunk Western main line can be cleared by pushing button 31. At the same time, it is also possible, for instance, to clear high signal 26 on the Michigan Central for a through movement on that line. Operation of the button extinguishes the red indicating lamp, thus informing the leverman that the red signal has changed to green. If the leverman should desire to change the lineup, he would push the button in the center of the track section in advance of signal 31 and this would immediately restore the red signal at dwarf signal 31. This operation would also initiate the operation of a time-element relay (with a time setting of one minute) which, at the conclusion of its operation, would permit the leverman to move traffic lever 20 to the left, preparatory to lining up the switches and signals for a Belt Line movement. If the leverman should inadvertently push the dwarf signal button for the reverse direction; in other words, if he should push button 5 instead of button 31 on the G. T. W., he could immediately rectify his error by pushing button 31, for the last mentioned operation would restore signal 5 to stop and light the green signal



One of the Power Switch Machines Controlled from a Desk-Lever Unit in the Tower

at dwarf signal 31. This operation would involve no time delay.

Whenever the route is changed by pushing the signal-restoring button in the center of the track circuit, the time-element relay is caused to operate, but only the signal on the particular track involved is changed to red, that is, any non-conflicting green signal on any of the other G. T. W. or M. C. tracks will remain green, even though the time-element relay starts to operate. A multiple connection of push-button contacts on the signal control panel prevents the changing of a green signal to red on any of the non-conflicting routes.

Although this electric plant is the simplest of any on the M. C., it is the most complete from the standpoint of electric locking protection. The interlocking of the electrical control is effected by means of two "master" relays.

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