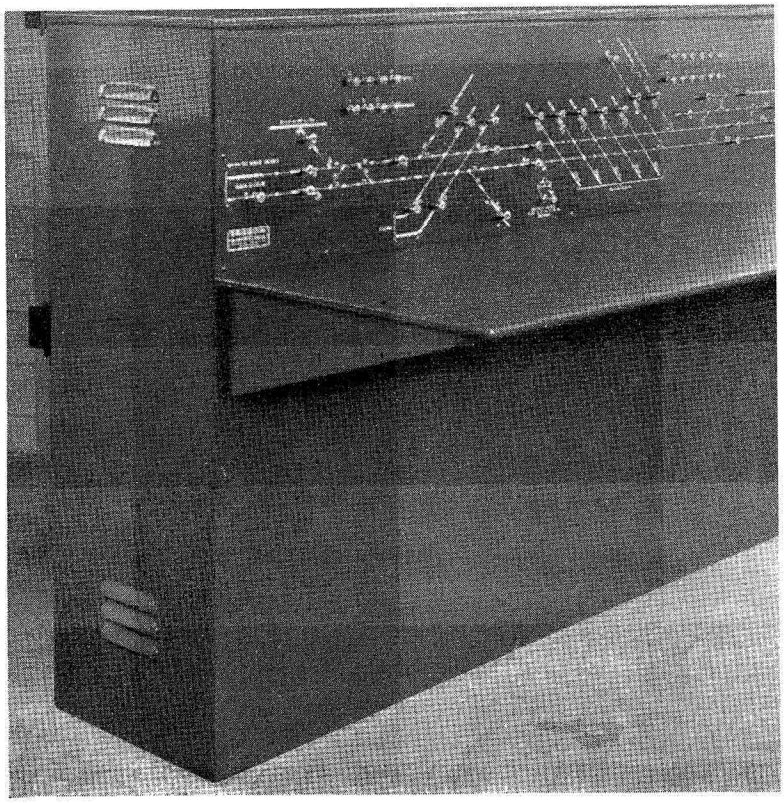
**Switches and signals in a route are lined up by operating two push buttons, signal indications are shown in face of buttons, switch indications and track-occupancy indications are shown in track diagram.**



The control machine is set at an angle so that the operator has a clear view of the tracks. Below—The Capitol Limited passing through the Western Avenue plant.

# B. & O. C. T. Installs Route Interlocking

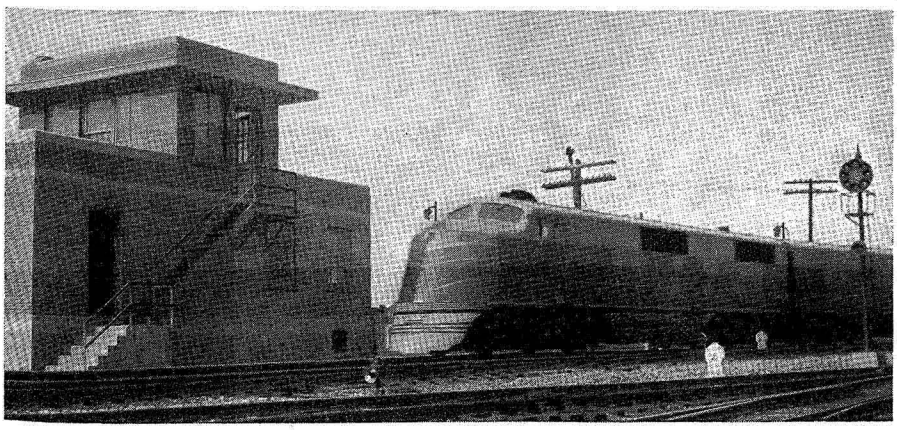
At a location near Western avenue and Fourteenth street in Chicago, the Baltimore & Ohio Chicago Terminal has installed an extensive new interlocking, a special feature of which is the application of a new type of route control rather than the conventional lever control. The control machine consists of a panel including an illuminated track diagram. On each of the lines representing the respective tracks, a push button is located at each point where a route through the plant may start. The operation of such a button initiates the setting up of a route, and subsequent operation of the same type of button at the location corresponding to the departure end of the route, completes the manipulation; following which the switches move to the proper position, and subsequently the signal clears.

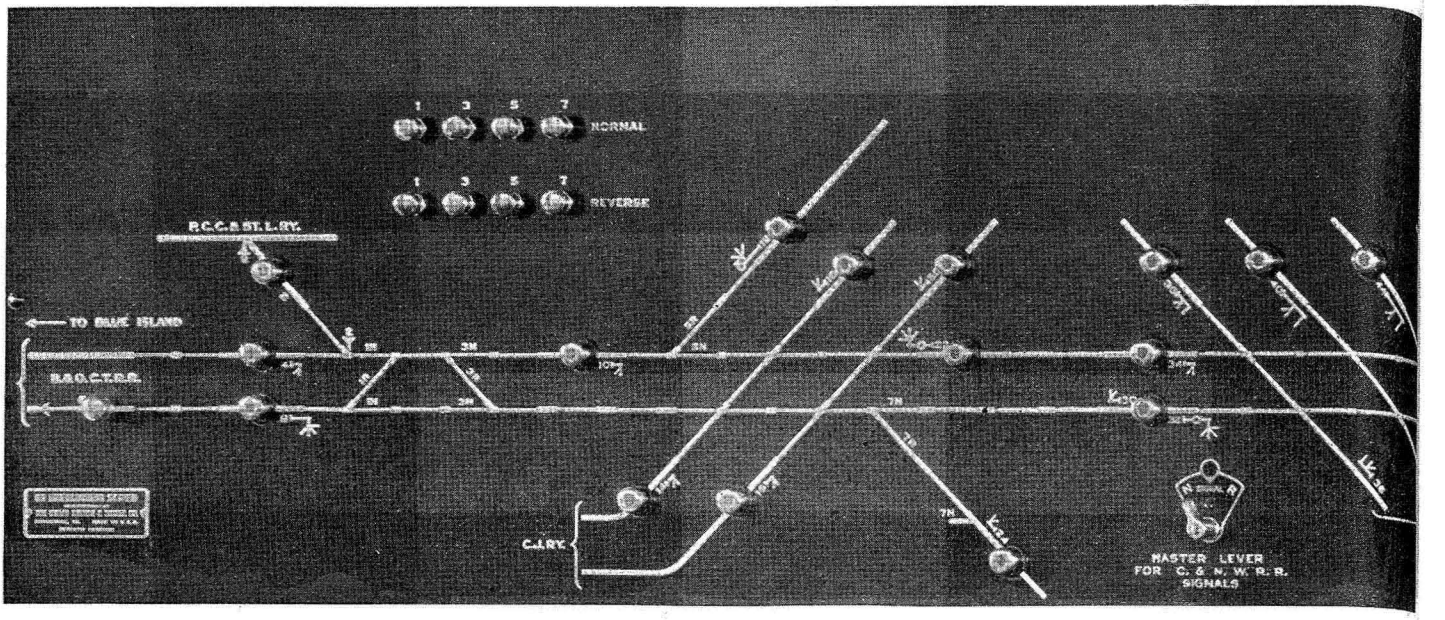
### Track Layout and Traffic

The track layout at the location of this new interlocking includes a junction between a four-track line and a two-track line of the B. & O. C. T., a crossing of a double-track line of the Chicago Junction railway with a double-track line of the B. & O. C. T., and also crossings of five switch tracks of the Chicago & North Western with the double-track line of the B. & O. C. T. The home-signal limits include 6 crossovers, 4 single switches and 33 signals.

The B. & O. C. T. tracks through this interlocking are a part of a main lead extending into the Grand Central Terminal, which is located 3.6 miles to the east of Western avenue. This passenger terminal is used not only by the Baltimore & Ohio trains, but also by Chicago Great Western, Pere Marquette and Soo Line trains. One or more freight stations of each of these roads are located between Western avenue and the terminal. All of the passenger trains operated in and out of the terminal, as well as switching moves to serve the freight houses and industries in this territory, are operated through this interlocking and over the main line of the B. & O. C. T. in the territory between Western avenue and the terminal. Trains of the Baltimore & Ohio and the Pere Marquette use the double-track line diverging to the south at the Western avenue plant. Trains of the Chicago Great Western and the Soo Line use the tracks extending westward through the plant.

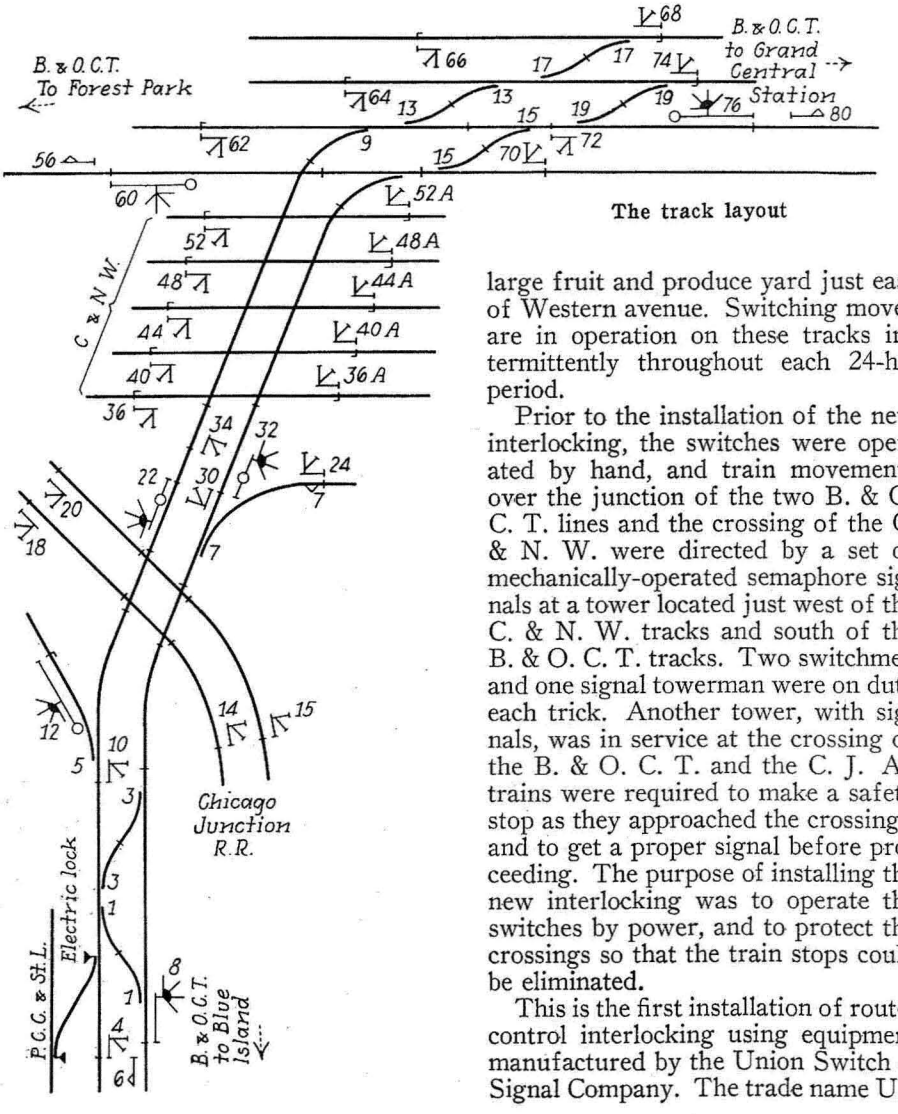
In periods of normal traffic, as many as 1,200 total moves are made over the plant daily. A total of 26






The route-control buttons are located in the face of the

scheduled passenger trains are now operated daily through the new interlocking, and the roads mentioned above also operate about 166 through freight, transfer and switch runs through the plant daily. The Chicago Junction operates about 60 freight trains daily through the plant. The five tracks of the C. & N. W., which crosses the double-track main line of the B. & O. C. T. in the plant, are yard lead tracks extending into a large fruit and produce yard just east of Western avenue. Switching moves are in operation on these tracks intermittently throughout each 24-hr. period.



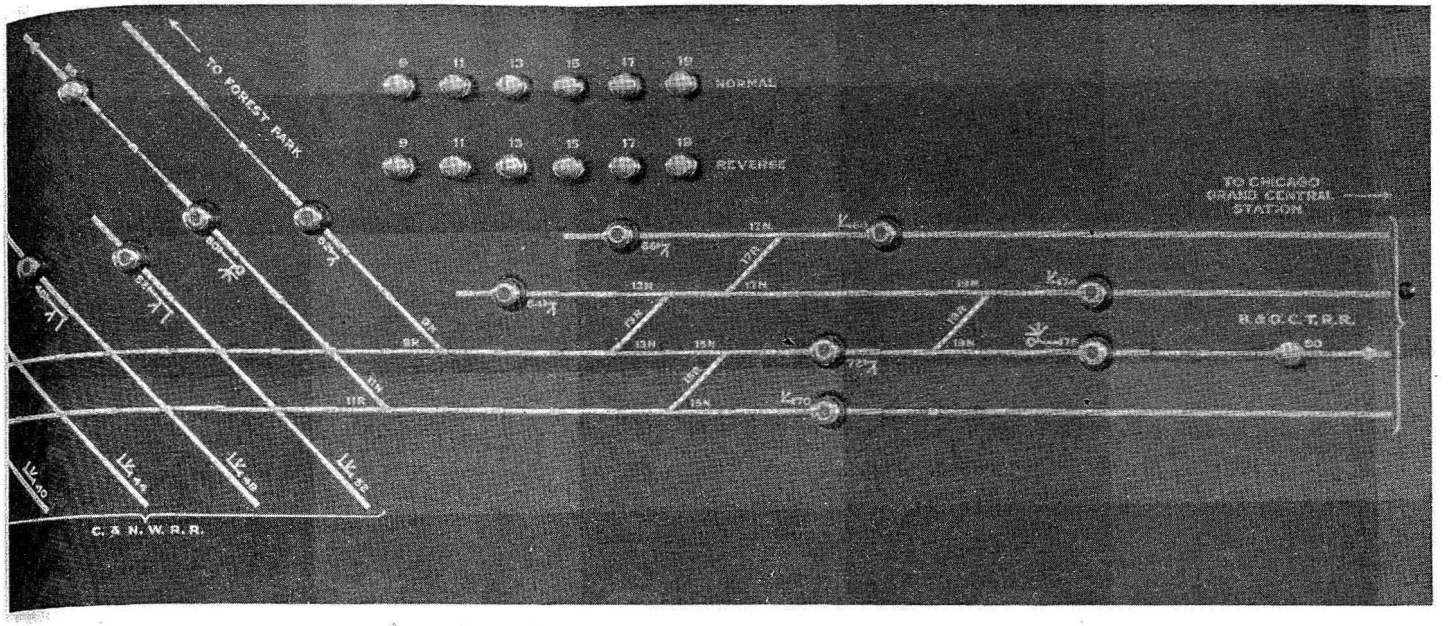

The track layout

Prior to the installation of the new interlocking, the switches were operated by hand, and train movements over the junction of the two B. & O. C. T. lines and the crossing of the C. & N. W. were directed by a set of mechanically-operated semaphore signals at a tower located just west of the C. & N. W. tracks and south of the B. & O. C. T. tracks. Two switchmen and one signal towerman were on duty each trick. Another tower, with signals, was in service at the crossing of the B. & O. C. T. and the C. J. All trains were required to make a safety stop as they approached the crossings, and to get a proper signal before proceeding. The purpose of installing the new interlocking was to operate the switches by power, and to protect the crossings so that the train stops could be eliminated.

This is the first installation of route-control interlocking using equipment manufactured by the Union Switch & Signal Company. The trade name UR has been adopted as descriptive of the term Union Route interlocking. The face of the control panel is made of sheet metal and is 14 in. high and 5 ft. 8 in. long. The machine case is 45¼ in. high and 17 in. from front to rear. A desk, supported by brackets, is attached to the front of the machine just below the panel, this desk being 30 in. from the floor, 21⅜ in. wide and 5 ft. 8 in. long. The machine is located in the new tower on the upper floor, which consists of a single room with windows on all sides so that the leverman has a clear view of the tracks in all directions. The machine is set at an angle so that the leverman can see in all directions, excepting east, without turning his chair. As the case of the machine is only 45 in. high, he can see over the top without leaving his normal position.

### Route-Control Buttons

The route-control buttons are located in the face of the machine panel in the lines representing the tracks, each button being mounted in the location corresponding with that of a signal which may govern a train movement to enter the plant or a section of the plant. Only one button is used at each of the locations corresponding to a signal. Such a button can be used either to initiate or to complete the control of the line-up for a route. The first button operated marks the start of the route, and thus determines the signal which will be cleared. The second button establishes the end of the route or, in other words, the track on which the train will depart from the plant. When a route is to be set up in the opposite direction over the same line-up of tracks and switches, the same two push buttons are operated in reverse sequence. The operation of




machine panel in the lines representing the tracks

the two buttons completes the control for a line-up of a route regardless of the number of switches involved, and, furthermore, as soon as the switches are positioned and locked, the signal or signals for the route clear, an important point being that not only the signal at the beginning of the route clears, but also signals within the plant on that route also clear. For example, in lining up a route from signal 8 to departure button 70, the operation of these two buttons lines up the route and causes not only signal 8, but also signal 32, to clear. On the other hand, if the route was to be established only from signal 8 to signal 32, then these two respective buttons would be operated, in which case signal 32 would not be cleared. Thus, routes may be established from signal to signal or through an intermediate signal to the end of the plant.

The buttons operate on the non-stick system of control, so that each button returns to normal position by spring action as soon as the operator removes his finger. The control set-up for a route is automatically cancelled by the passage of a train. Therefore, no further manipulation, comparable to lever restoration, is required of the operator. When it is desired to cancel a route manually, the push button which was operated first is *pulled* toward the operator. A call-on signal is displayed by re-establishing the route control in the same manner, when the route is occupied.

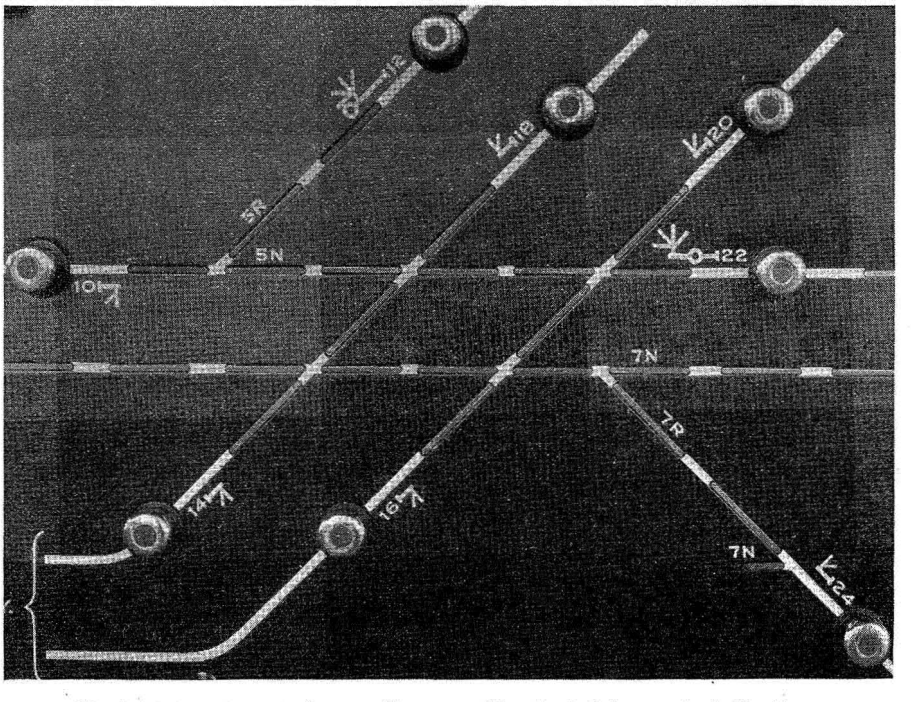
### Signal Indication on Control Machine

Information concerning the aspects being displayed by a signal is indicated in each instance by lamps, which are mounted behind the corresponding push button, and which throw light through a lens located in the center of the button. Normally the lamps are extinguished. When the first button of a route set-up is operated, the indication lens in that button is illuminated to show red. This indicates that the route set-up is still incomplete and that the signal has not cleared. As soon as the route is completed and the signal clears, the indication in the button changes from a red to a green. This green indication burns steadily when a high-speed, medium-speed or slow-speed signal clears, but the indication lamp flashes green when a stop-and-proceed, call-on signal is cleared.

The indication lamp in the button at the leaving end of a route ordinarily remains extinguished, but if an attempt is made to set up a route which is not available, a red light will appear in that button as an indication of improper manipulation. In such a case, both buttons must be *pulled* in order that the controls may be restored to their normal condition.

### Control of Alternate Routes

In some instances, alternate routes are available within the plant for a train passing from an arrival point to a departure track. For example, between signal 34 and 74, the preferred route is via switch No. 9 reversed, No. 13 reversed, No. 17 normal and No. 19 normal. A secondary route, however, may be arranged via No. 9 reversed, No. 13 normal, No. 15 nor-




Moulded translucent glass sections are illuminated for route indications