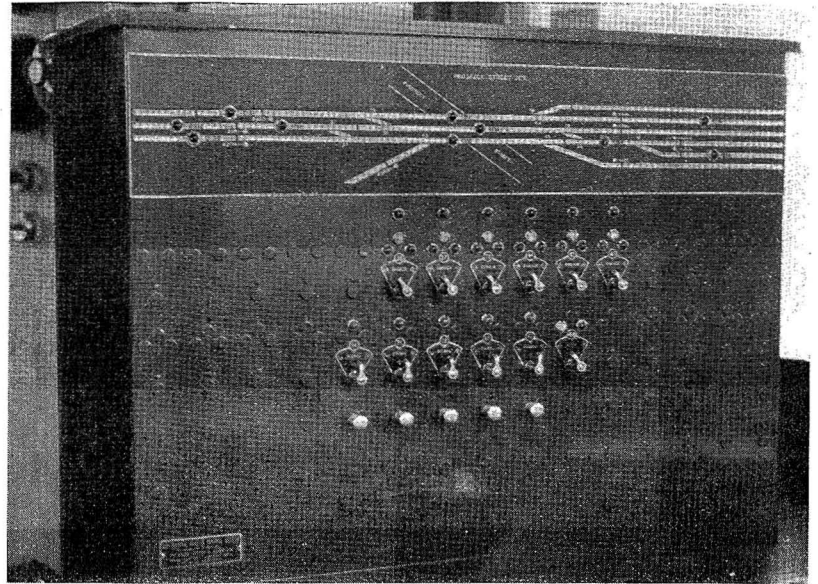


The control machine for the Prospect Junction layout is located in the tower at the Big Four crossing



Combination of interlockings, remote control and traffic locking improves safety, expedites the operation of trains and effects economies.

Signaling and Interlocking on the

IN ADDITION to the operation of the Union passenger station at Indianapolis, Ind., the Indianapolis Union Railway Company owns and operates a double-track outer Belt Line, which extends practically all the way around the city, making connections with 14 main lines of various railroads, as well as connecting with numerous yards, industries and public utility plants. No passenger trains are operated on this Belt Line, the traffic consisting of switching cuts being operated between different connections or yards, as well as through freight trains which are operated by way of the Belt Line to avoid the passenger terminal and business section of the city.

At a considerable number of the railroad crossings and junctions on

the Belt Line, interlockings have been in service for years, while at a few junctions, ends-of-passing-tracks, etc., hand-throw switches have been used. In 1937, an interlocking and signaling program was instituted to provide interlocking protection at some of these layouts, in order to improve safety and to expedite train operation.

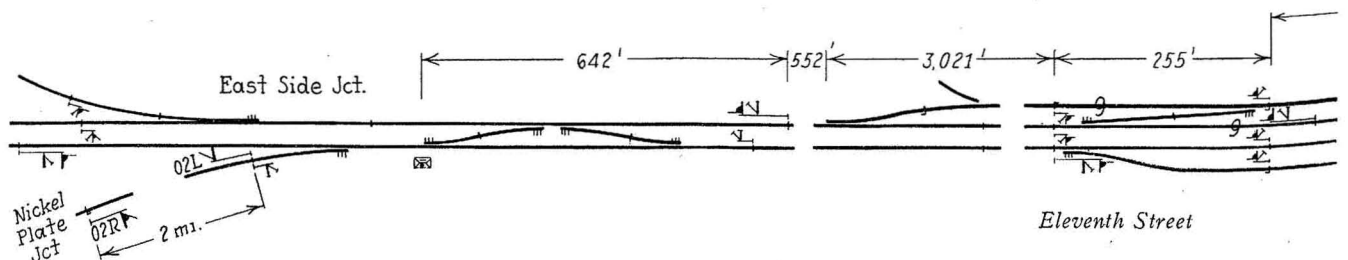
Improvements at East Side Junction

At East Side Junction, near the intersection of Sherman drive and Twenty-First street, the track layout includes two crossovers, a turnout to the east connecting with the Big Four line extending to Springfield, Ohio, and a turnout diverging to the west about two miles to L. E. & W.

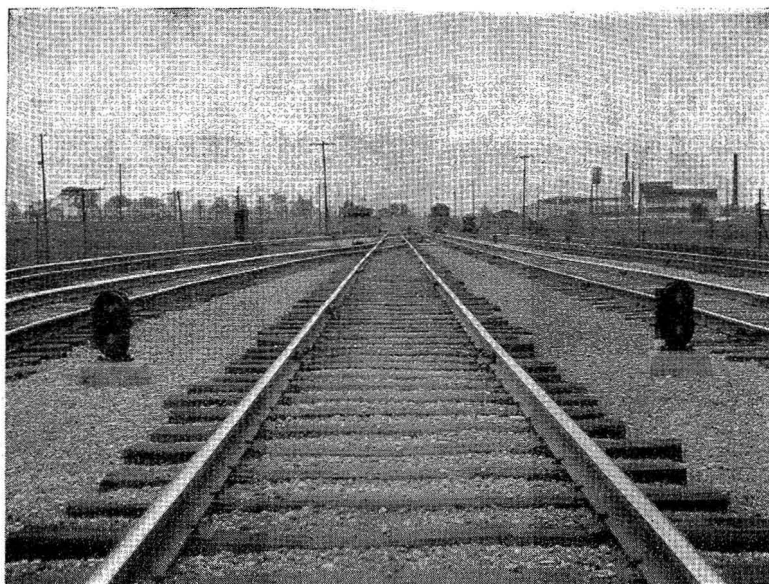
Junction, where connections are made with the Nickel Plate and the Monon. Numerous industries requiring considerable switching are located on this line.

The switches in the East Side Junction layout were previously operated by hand-throw stands, handled by an operator who also controlled mechanical signals to direct the train movements over the junctions.

From East Side Junction at Twenty-Second street, two main tracks extend directly south to Eleventh street. In addition, a track on the east side, used principally for switching various industry spurs, extends from a point 1,100 ft. south of East Side Junction to Eleventh street. At Eleventh street there is



Track and signal plan of territory between



Dwarf signals at Prospect Junction with tower at Big Four crossing in the background

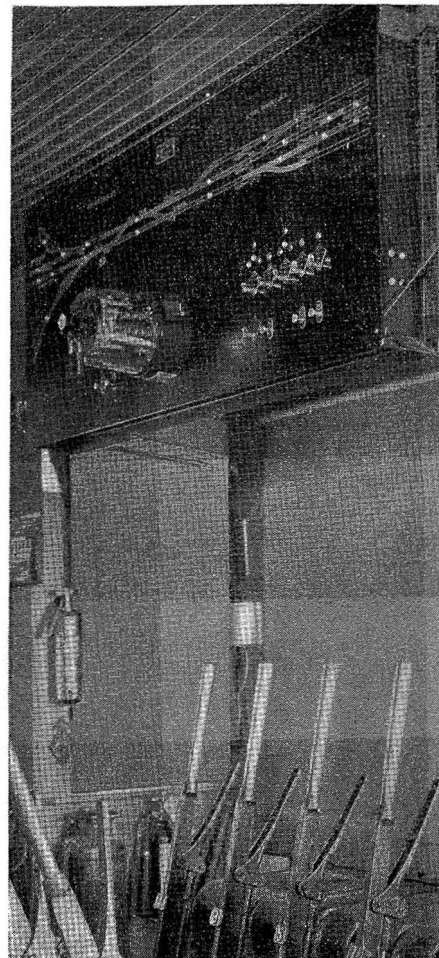
Indianapolis Union Railway

a three-track—four-track junction from which point four tracks extend one mile to Panhandle Junction, where an eight-lever electro-pneumatic plant, controlled by a Type T-C table interlocker, includes three crossovers and several turnouts leading to industry connections and to the Pennsylvania.

Plant Moved

A mechanical interlocking was previously in service at Eleventh street. As a part of the signaling improvements, this mechanical interlocking was moved to East Side Junction, where eight of the mechanical levers were used, four to operate two crossovers and two junction switches, and four to operate

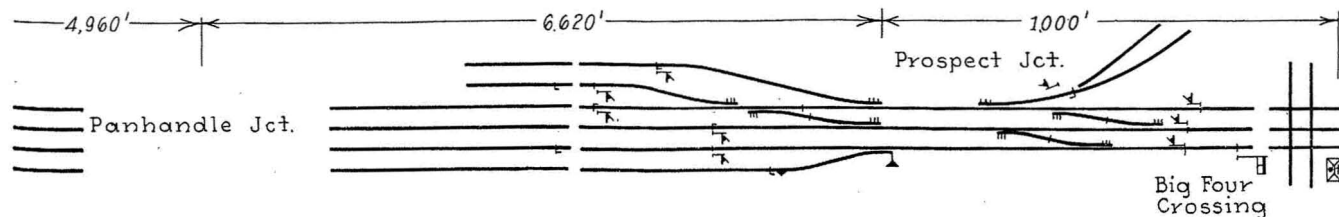
four facing-point locks. A B-30 type control cabinet, mounted above the mechanical interlocking machine, includes an illuminated track diagram and also a set of miniature-type non-interlocked levers, which are used to control not only the signals in the East Side Junction layout but also the power switch machines and signals in the layout at Eleventh street. With this arrangement, the operator at East Side Junction has charge of the direction of trains in the normal direction of traffic on the double track between that point and the Eleventh Street layout. Two of the miniature levers in this group are used for the control of traffic-direction locking for reverse-running train movements between East Side Junction and Eleventh street, as well



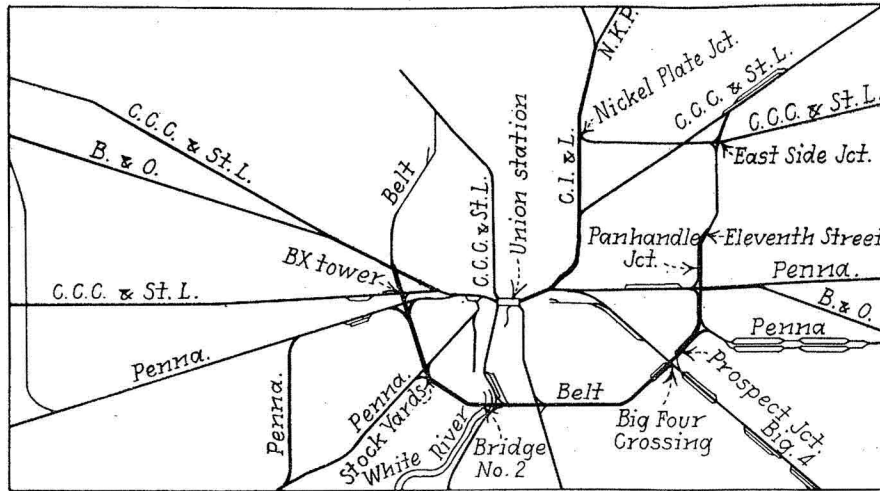
At East Side Junction the miniature levers for signals are mounted in a cabinet above the mechanical machine

as between Eleventh street and Panhandle Junction.

Also, one miniature lever, at the left center of the panel at East Side Junction, is used to control signals 02L and 02R at the two ends of the line between East Side Junction and



East Side Junction and the Big Four crossing



Map of the Belt showing the locations of the new signal and interlocking installations

Nickel Plate Junction, a distance of 2.15 mi., thus, in connection with track circuits throughout, forming a traffic-locking arrangement for directing train movements between these two junctions. When a switching train is serving the industry spurs in this territory, neither signal 02L nor 02R can be cleared, as long as any intervening track circuit is occupied. The direct-wire system of control is used for the remote control of the switches and signals in the layout at Eleventh street, as well as for the traffic-locking circuits.

Prospect Avenue Remote Control

Between Panhandle Junction and Prospect street, 6,620 ft., there are two main tracks and two passing tracks, making four tracks. At Prospect street, two turnouts to the east lead to the Hawthorne yard of the Pennsylvania. This Prospect Street layout also includes three crossovers and two more single

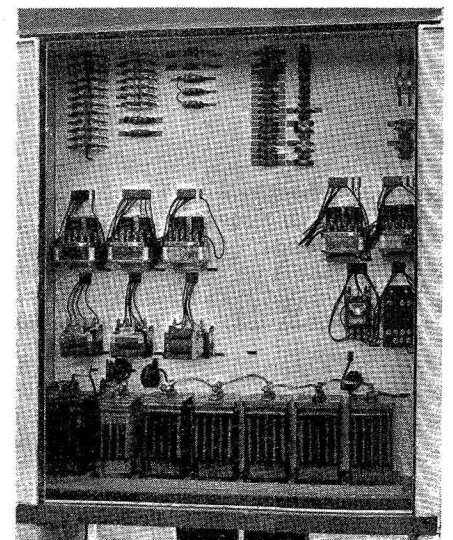
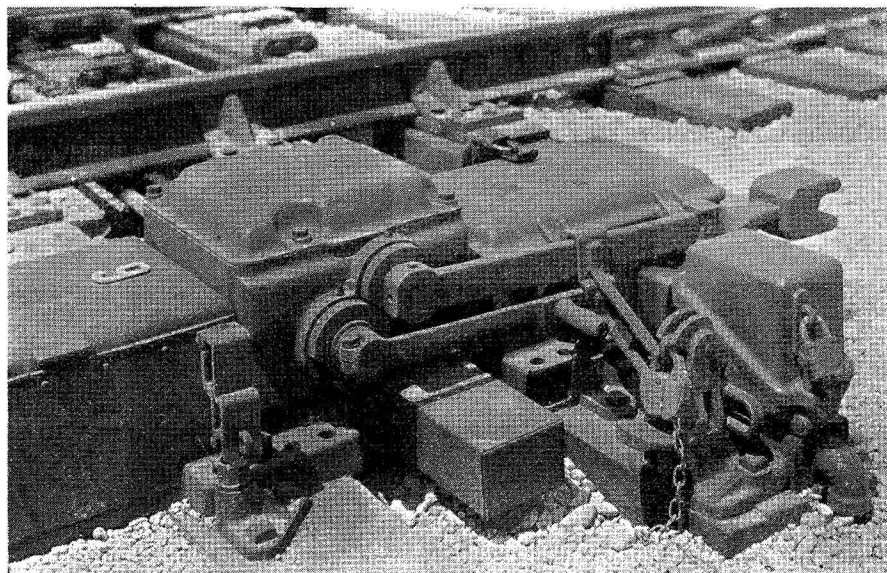
switches. Under the previous arrangement, these switches were all operated by hand-throw stands. As a part of the signaling improvement program, power switch machines were installed for the operation of the three crossovers and three of the single switches, an electric lock being installed on the switch at the end of the southward siding. Color-light type dwarf signals were installed to direct train movements. These signals, as well as the power switches and the electric switch lock, are controlled from a Model B-30 miniature-lever type machine located in the tower at the C. C. C. & St. L. crossing, the distance from Prospect street to the tower being about 1,000 ft. This machine, as shown in an illustration, has six signal levers and six switch levers. The direct-wire control system is used for the control of the signals and switches. The machine is located at the end of the operator's desk, opposite the mechanical interlocking machine for

the interlocking which includes the crossing of the two roads.

Remote Control at Bridge No. 2

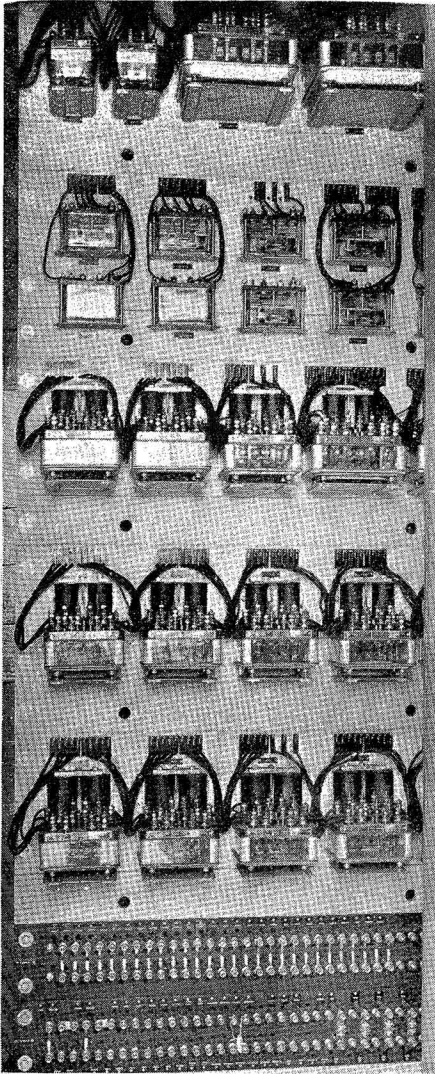
At a point known as bridge No. 2, just west of the bridge over White river, there is a junction between the two main tracks and a third running track located south of the other two tracks, this third track being used for operations of trains in either direction. The three tracks extend west through the Union Stock Yards and north to Vandalia Junction, which is located directly west of the Union passenger station. The switch at bridge No. 2 was previously operated by a hand-throw stand, which introduced considerable delay, especially to westbound trains which were to be diverted to the track on the south side. In order to facilitate these train movements, a power switch machine and three two-position dwarf signals were installed. This switch and these signals are controlled by direct-wire circuits from two desk levers in the office at the Union Stock Yards, about 3,200 ft. away.

Thus, by this series of interlockings and remote control layouts (extending from East Side Junction through the new remote control layout at Eleventh street, through the existing interlocking at Panhandle

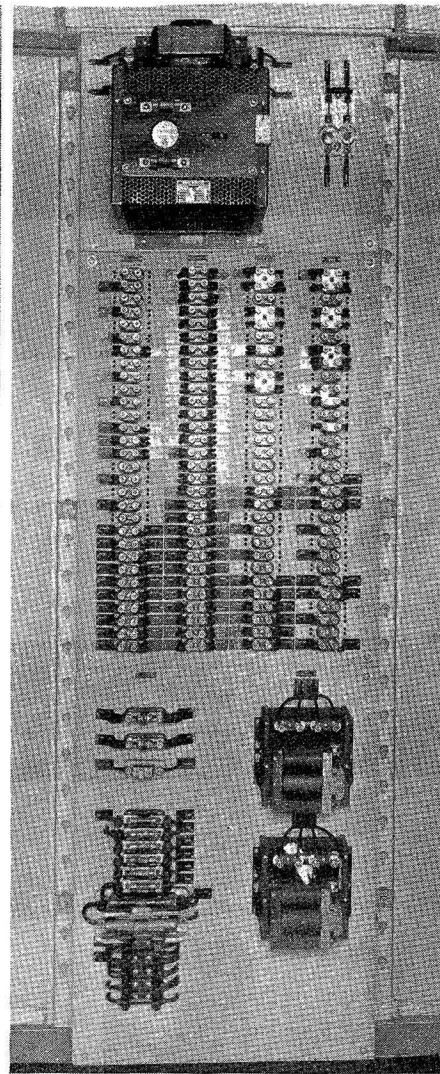


Welded sheet-metal cases house the instruments and battery at outlying locations

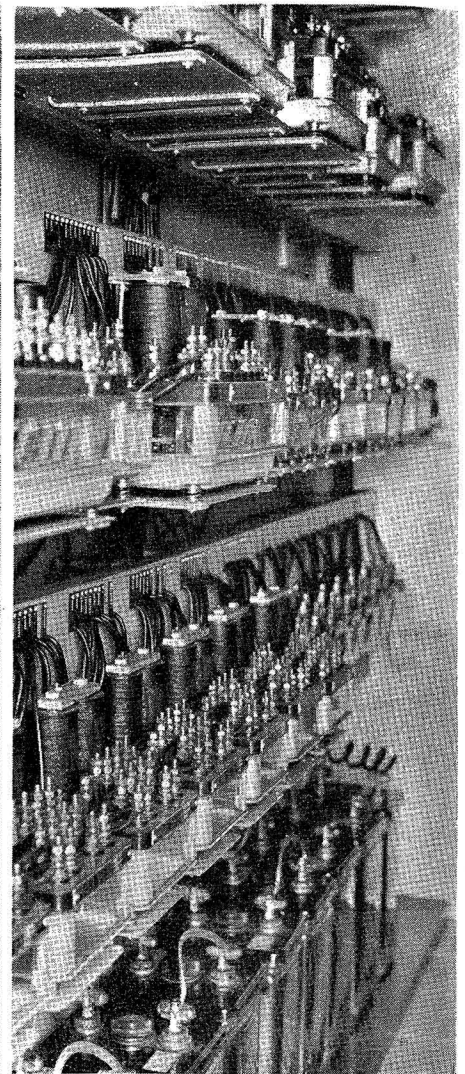
Left—Electric lock applied to dual-control machine locks both levers. When lock is unlocked, the hasp lever is swung up, being hinged at the rear end, then the selector lever and the hand-operated switch lever can be moved



Relay cabinet in the tower
at East Side Jct.



Terminal and power board
at Eleventh street



Instruments and battery in
typical steel house

Junction, the new remote control at Prospect Street Junction, the mechanical plant at the C. C. C. & St. L. crossing, and through the layout at bridge No. 2 controlled from the Union Stock Yards), the Belt railroad now has signal and interlocking facilities to handle the more important junctions, so that safety of train operation is improved and train movements are facilitated.

Special Switch Features

The power switch machines on this entire layout are of the M-22 type. Each switch layout is equipped with lock rods and a point detector. The track on the east side extending north from Eleventh street is used as a switching track to serve numerous industries, and considerable switching is done also by using crossover No. 9. The machines on these two switches are equipped with dual-control. As a means of preventing trainmen from unauthorized use of the dual-selector and manual lever

on these machines, each machine is equipped with an electric lock which locks both the levers. These locks are controlled remotely by a miniature lever on the control machine at East Side Junction.

Batteries and Cable

The switch machine at bridge No. 2 is equipped for operation on 110-volt, a-c. power. The remainder of the switch machines are operated by 110-volt d-c. motors fed from storage battery. For example, at Eleventh street and also at Prospect street, a set of 55 cells of Exide DMGO-5 type battery is used to supply the switch machines. The batteries for the line circuits are the DMGO-9 type and for the track circuits the DMGO-7 type. The signals on the entire installation are the color-light type.

At Eleventh street, as well as at Prospect street, a 6-ft. by 10-ft. sheet-metal instrument house is used to house the relays, batteries and

other instruments which can be located at a central point on each layout. At outlying points and also at the tower at the C. C. C. & St. L. crossing, sheet-metal cases are used to house instruments.

At the remotely-controlled layouts at Eleventh street, as well as at Prospect Street Junction, the wiring distribution between the instrument houses and the switches and signals is all in underground cable, using No. 9 conductors for the switch feed circuits and No. 14 conductors for the control circuits. Aerial cable extends from East Side Junction through Eleventh street to Panhandle Junction.

This installation was made under the jurisdiction of J. J. Liddy, superintendent, and E. O. Wood, engineer maintenance of way, Indianapolis Union Railway, and under the supervision and inspection of T. M. Boyd, signal and electrical foreman. The Union Switch & Signal Company furnished the plans and materials, and handled the construction as well.