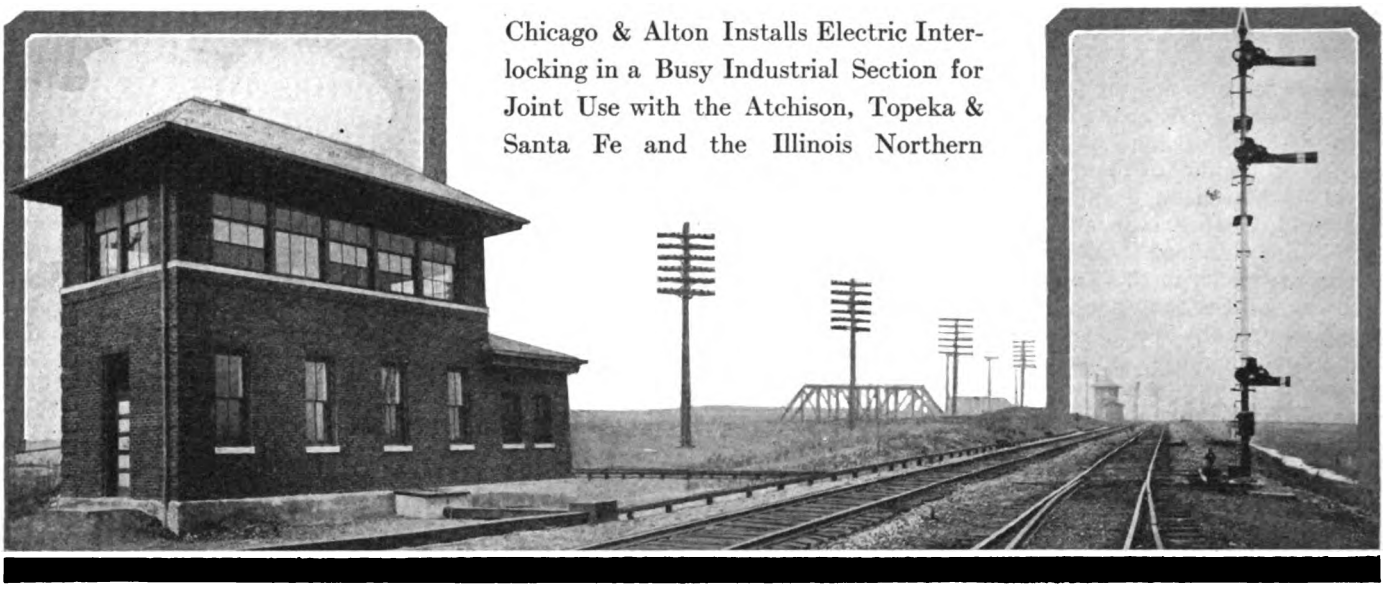
New Plant in Chicago Terminal District

Chicago & Alton Installs Electric Interlocking in a Busy Industrial Section for Joint Use with the Atchison, Topeka & Santa Fe and the Illinois Northern



Exterior of the New Tower *Home Signal on the C. & A.*

THE new electric interlocking plant at Corwith (Chicago), Ill., about six miles from the Chicago union station, will eliminate the necessity for stopping about 45 through passenger trains each day on the main lines of the Chicago & Alton and the Atchison, Topeka & Santa Fe, and in addition will greatly facilitate the numerous through freight and local switching movements at this point. The plant is located at the crossing of the Illinois Northern with the Santa Fe and the Alton, and includes in addition to the double crossing, junctions and wyes on both tracks as shown in the layout. This location is in the industrial district of the city's southwest side, the Illinois and Michigan canal being located between the Santa Fe and the Alton, and the drainage canal just north of the Santa Fe. Large terminal and classification yards are located in all directions from the plant on the roads involved, and switching moves between these yards are being made across the plant almost continuously during certain portions of the day. Four switch engines are always in service within the limits of the plant, and at times 19 trains or engines have been counted waiting to make a move through the plant.

On the Chicago & Alton the Glenn yard, where all interchange business from foreign roads is received, is located about three miles west of Corwith, and a large engine terminal and yard are located at Brighton Park, about one-half mile east of the new plant. The Santa Fe's Corwith yard, its principal terminal in the Chicago district, lies immediately south of the double crossing and the Thirty-third street yard of the Illinois Northern immediately to the north. While at the crossing the Illinois Northern has only a single track and the Santa Fe and Alton each two tracks, the Santa Fe expands to three tracks just east of the plant and to five tracks just west, while the Alton has four tracks on each side of the crossing. The tower adjoining the Alton main line is placed back from the nearest track a sufficient distance to allow the addition of a third track if this becomes necessary in the future. The plant is very much spread out on account of including all of the junctions, there being a distance of about 3,000 ft. from the tower to the five-track bridge on the Santa Fe west of the crossing, about 1¼ miles to two outlying switch locks on the Santa Fe to the west, and about 1½ miles to the A. T. & S. F. distant signal on the west, which is also the home signal for the interlocking plant at Nerska, used jointly by the Chicago & Alton, the Atchison, Topeka & Santa Fe, and the Chicago & Western Indiana.

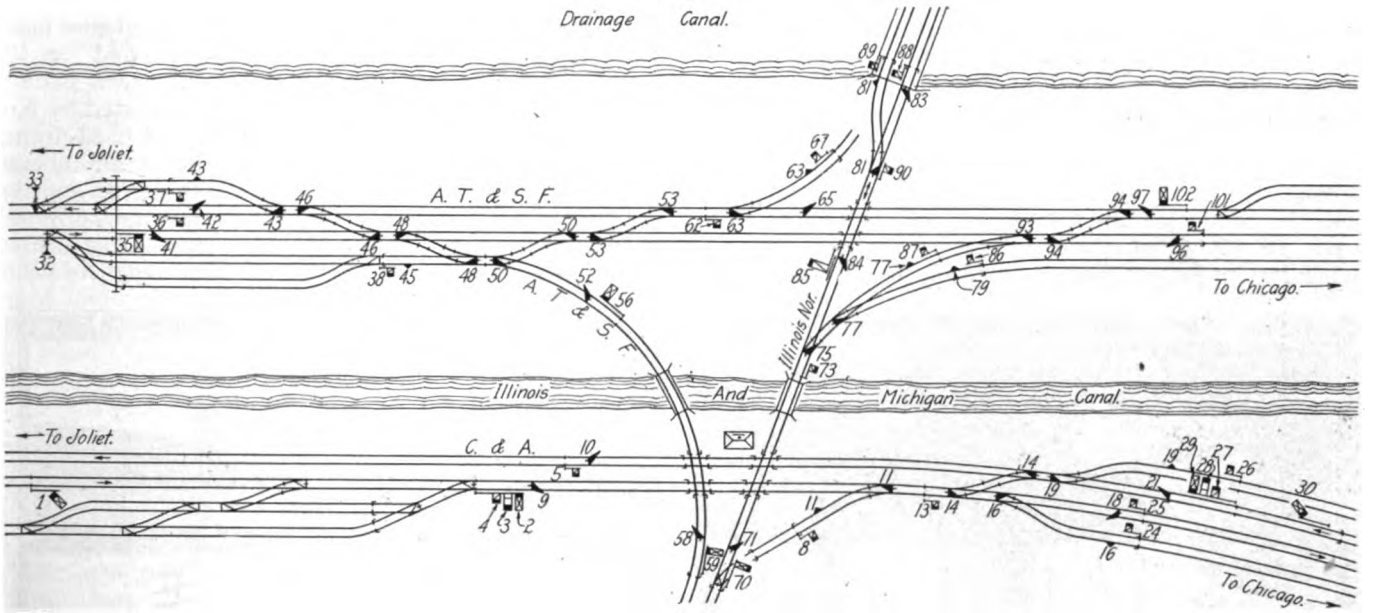
This double crossing was formerly protected by a mechanical interlocking plant, which was taken out of service in 1910. Since that time the Chicago & Alton has maintained one switch tender at this point, the remainder of the switching being handled by train crews. The decision to build the new plant was made on the double ground of providing desirable protection at this busy point and facilitating train movements.

The Tower

The tower, as shown in the illustration, is a brick structure on concrete foundation with slate roof, having two stories with the exception of a small single-story addition on one end which houses the storage batteries. The ground floor of the main portion of the tower is divided into two rooms, one for the hot water heater and maintainer's quarters, and the other for the relay cabinet and power units. The second floor of the tower is occupied entirely by the operator's room.

Power Supply

The normal supply of power is obtained at 220 volts a.c. from an adjacent commercial line which supplies a motor-generator set, having a 110-volt d.c. generator used normally for charging the storage batteries. The 220-volt line also feeds a small style K transformer with 75-volt and 10-volt taps for locks and lever lights. The emergency power supply is furnished by a Fairbanks Morse d.c. dynamo direct-connected to a gas engine. The dynamo supplies 5.5 kilowatts at 110 to 175 volts, and 21.4 amperes. A one-panel switchboard is included for the control of the motor-generator set and for battery charging. The battery installation consists of 57 cells of 200 a.h. capacity Electric Storage Battery chloride accumulator type for switch and derail machines, and high signals, and two sets of five each of 200 a.h. battery of the same type for lever lights, locks and repeating relays. The circuits are arranged to charge the large

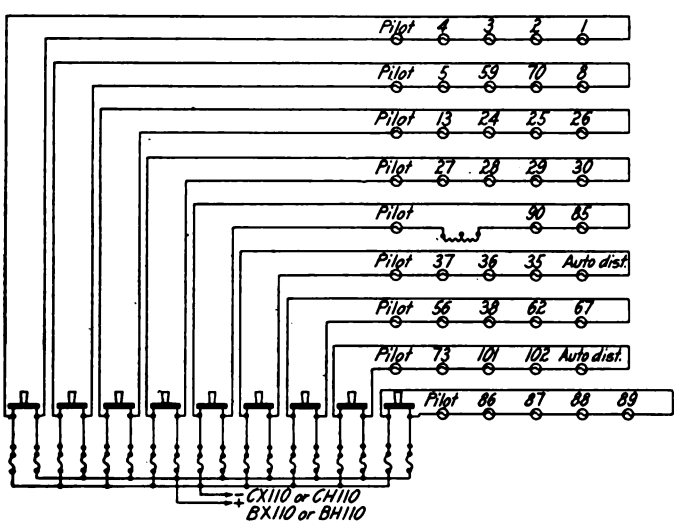


Track and Signal Layout of the New Interlocking Plant at Corwith, Ill.

battery and one of the small batteries at the same time. This battery is supported on a wooden rack of special construction, being mortised and pinned together without the use of nails.

Interlocking Machine

The interlocking machine is of the G. R. S. unit-lever model 2 type with 78 working levers in a 104-lever frame.



Signal Lighting Circuit Showing Arrangement of Pilot Lamps

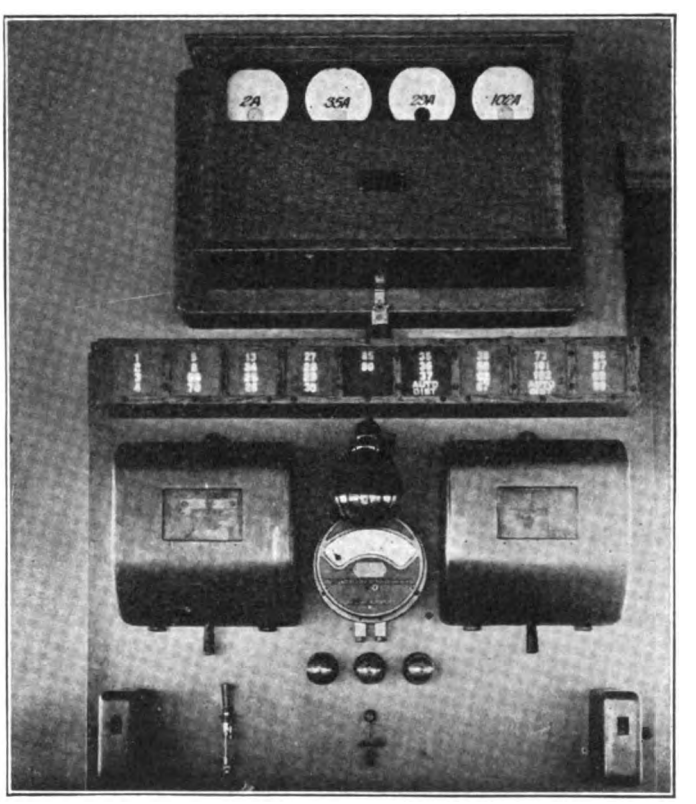
The additional room is provided for additions to the plant that would be necessary if a third track is added on the Chicago & Alton. Lever lights are provided in the machine which are lighted when a track circuit is occupied. These lights can be operated from a 10-volt a.c. or d.c. circuit, and the lever locks from a 75-volt a.c. or 10-volt d.c. circuit.

Signals

A marked difference is noticeable between the signaling standards on the two principal roads in this plant. The Santa Fe uses a one-arm signal with 10 to 12 possible routes, while the Chicago & Alton has three-arm signals for three routes. No distant signals are provided on the Illinois Northern, as only switching movements are made over that line. As the normal-danger system is used on the Chicago & Alton west of this plant, a special control circuit was necessary for the first automatic signal to the west. This circuit operates as follows: When a westbound train strikes the annunciator circuit, the control of the first two-position automatic signal west of Corwith clears on the back point of the annunciator, and holds clear on the back point of the track relays between the home signal and the advance signal after the train passes the home signal.

Pilot Lights

All signals are electrically lighted, five lights being connected in series on separate 110-volt circuits. This allows 28-volt lamps to burn slightly under voltage. Pilot lights located over the interlocking machine in the tower are connected in each lighting circuit so that if any one light fails, an immediate indication will be provided. As the five lights in series are in all cases located near to-



Indicators and Pilot Lights Back of the Machine

gether, it is a comparatively easy matter for the maintainer to locate the trouble. This system has been in service more than a year at another point on the Chicago & Alton, and has given very good satisfaction.

Locking

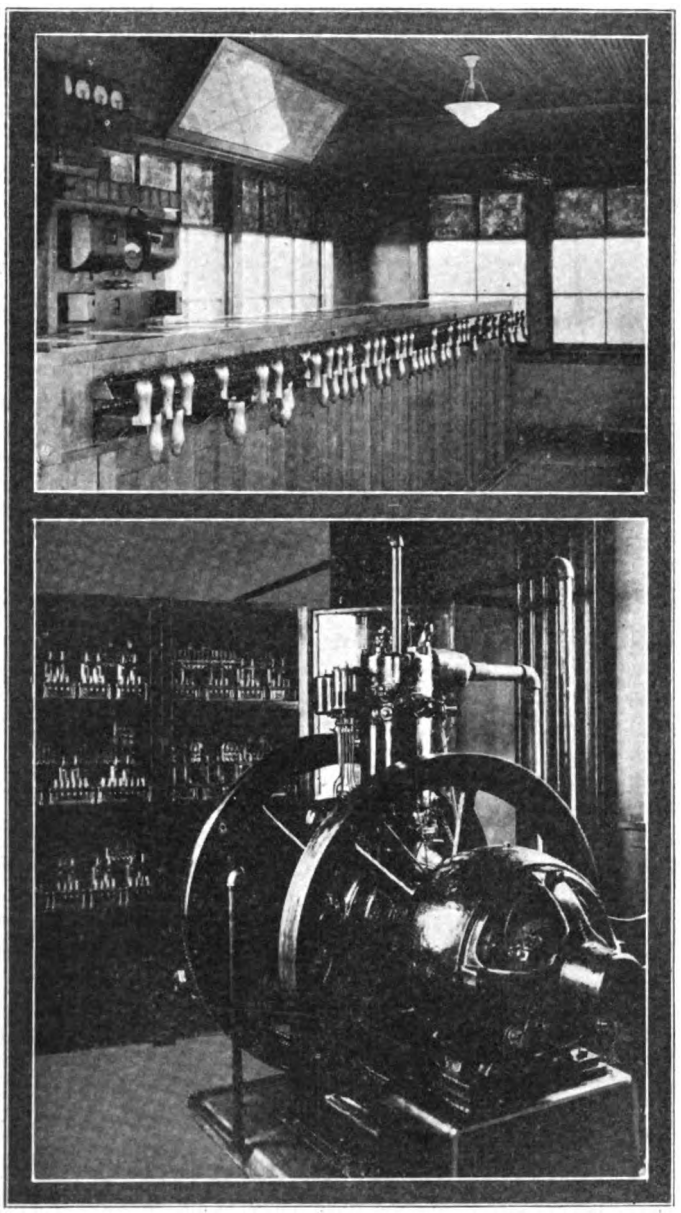
Approach, route and sectional locking are provided on both the Santa Fe and the Alton with annunciators to warn the towerman of the approach of trains. No annunciators or locking are provided on the Illinois Northern. G. R. S. push releases are used for track circuits, and screw releases for signals and switch locks. The operation of the electric switch lock requires the cooperation of the operators at Corwith and Nerska.

General Details

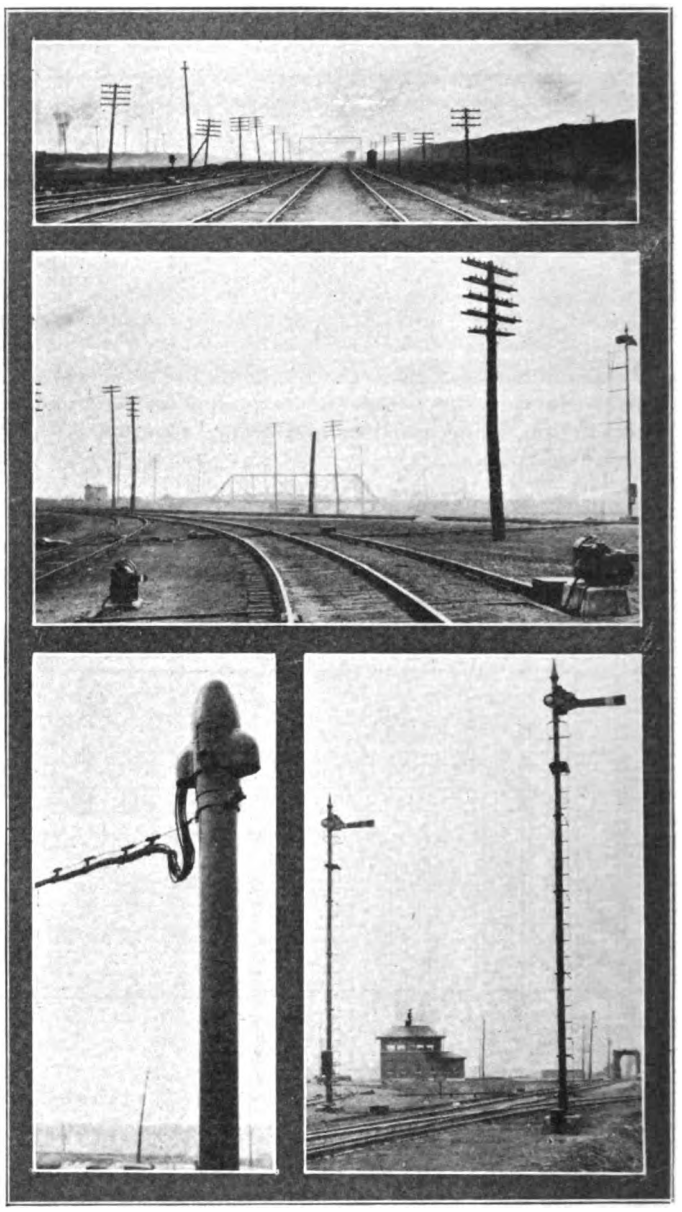
All track circuits are d.c. supplied with energy from BSCO battery located in battery chutes. The battery for operating distant signals is of the same type located in wells. All relays are of G. R. S. manufacture. Switch machines are G. R. S. model 2, and all signals are G. R. S. 2A upper quadrant.

Okonite insulated wire was used throughout, the main common being No. 1, signal common No. 6 and No. 10, controls No. 10, No. 12 and No. 14, and track battery leads No. 12 stranded. Cable drops are supported by No. 8 messenger wire, the ties being of No. 12 hard-drawn insulated line wire located about 18 in. apart. These ties are made with five wraps between the cable and the messenger, and five each way on the messenger, crimped up tight with pliers. This method of tying has been used on this road for several years and has proved its value as the ties will not slip on the messenger and thus allow the cable to sag. All tower wiring is in iron conduits, the outside wires being brought in from the concrete junction box just outside of the tower through conduit in the concrete floor to the relay box and the machine.

This plant was installed by the General Railway Signal Company under contract with the Chicago & Alton, and will be operated by the Alton. We are indebted for courtesies in securing the above information to G. W. Hulsizer, superintendent of telegraph and signal engineer, and S. U. Rhymer, general signal inspector of the Chicago & Alton.



Two Interior Views Showing the Operating Room and the Emergency Gas Engine Set with a Portion of the Relay Rack



Exterior Views of the Plant From Various Angles, Showing Also at the Lower Left a Detail of the Cable Hanger in Use