## MAIN STREET TOWER, ON THE CHICAGO & NORTH-WESTERN, AT EVANSTON, ILL.

The Main street interlocking plant on the Chicago & North-Western, at Evanston, Ill., which has been in service about seven months, was built in connection with the track elevation work through Evanston, following the completion of the third track to that point. Evanston is a suburb of beautiful residences, and great care was taken in the design and execution of all the improvements in this vicinity to make the finished work present an attractive appearance in keeping with the surroundings. The signal tower and the outside connections of the interlocking plant conform entirely to this ideal, as is shown by the accompanying views.

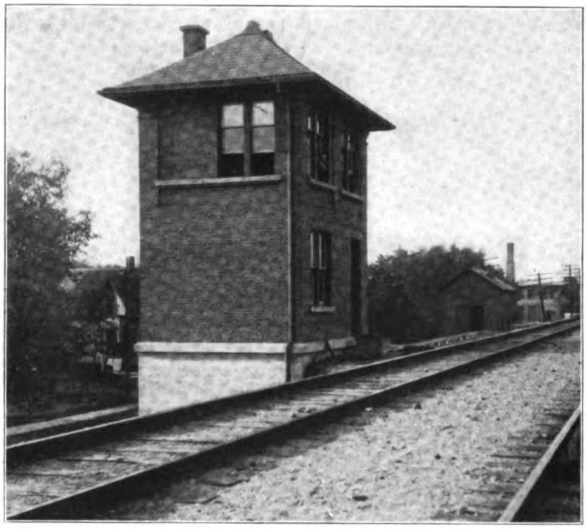

Fig. 1. Main Street Tower.

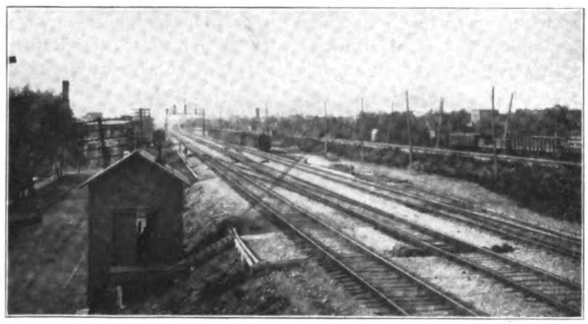

Fig. 2. Track Lay-Out and Charging Station.

The tower is of brick, having the same fireproof construction that is used in the station. All exterior wiring is run in lead-sheathing cables in bituminized fibre conduit laid in concrete, with brick manholes at distributing points. This is an especially commendable feature of the work, as it removes the wooden trunking from the right-of-way, greatly improving the appearance of the layout, and securing, at the same time, the best possible construction.

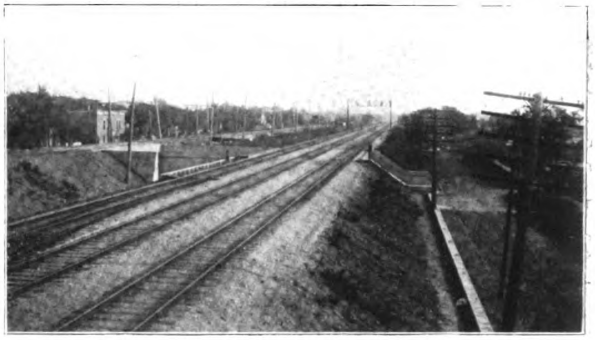

Fig. 3. Track Lay-Out South of Tower.

The interlocking governs the crossovers between the three tracks. The middle track is used from midnight to noon, for southbound movements, and for northbound from noon to midnight. The North-Western has a heavy suburban service to Chicago, and the inbound express suburban trains, which make no stops between Evanston and Chicago, are crossed over from

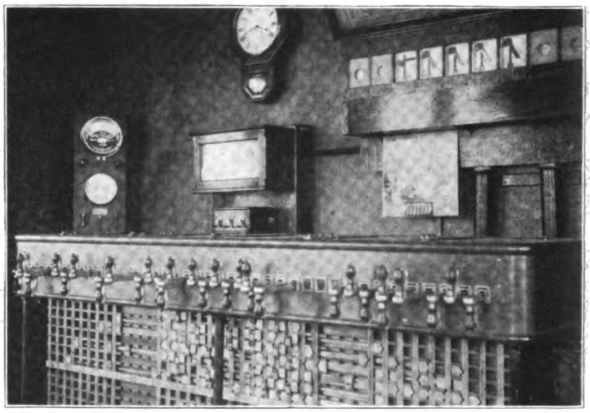

Fig. 4. The Interlocking Machine.

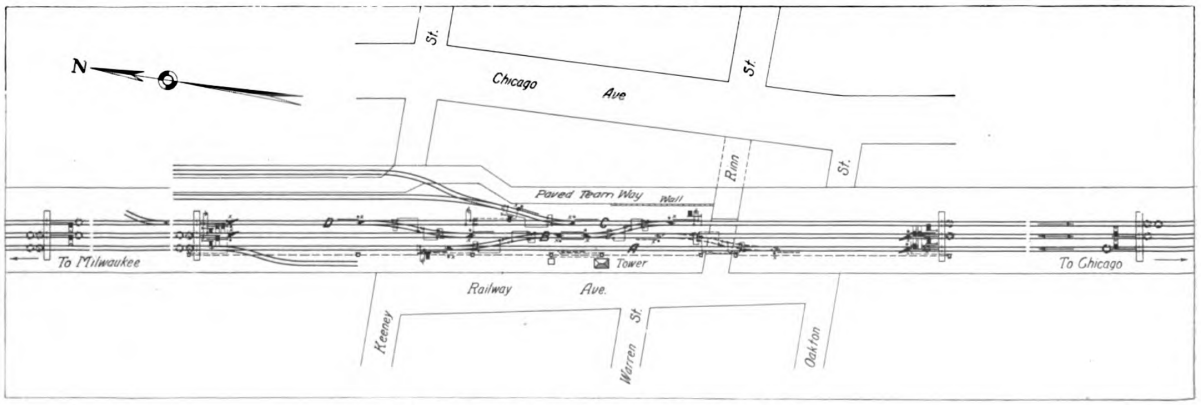


Fig. 5. Track Plan of Main Street Interlocking.

the outside to the middle track at this point. The plant also controls a turnout to a yard track as shown in the accompanying layout. About 200 train movements are handled in each 24 hours.

All of the switch and signal mechanisms for the plant were furnished by the General Railway Signal Company. The switch movements are Model 2, the high signal mechanisms Model 3, and the dwarf signal mechanisms Model 2. All of the signals give two-position, lower quadrant indications. Short derails are used for low-speed movements, and for high-speed a facing point, continuous rail, derail of the Carter type is the standard.

The tower has the battery room on the first floor, and the interlocking machine and accessories on the second, and is heated by hot water from a small heating plant on the first floor. A spiral interior stairway leads up to the second story. The machine is the standard General Railway Signal Company's all electric interlocker, having a 40-lever frame, 10 high signal levers, 7 dwarf signal levers, 7 switch levers, and 5 derail levers, a total of 29 working levers. There are 4 spare levers and 7 spare spaces.

There are two groups of indicators, the annunciator and slot group, and the track repeater indicators. The annunciator and slot indicators were furnished by the Hall Signal Company, as the plant is in automatic block territory signaled with Hall disc signals. There are four annunciators, two for movements in each direction, and five semaphore indicators, two for the distant signals at the south end of the plant, and three for the four home signals, only one indicator being required for the opposing home signals on the middle track. The indicators are used on the north-bound distant signals since they are used to repeat the indication of the slotted home signals and may, therefore, go to danger behind a train, without the towerman throwing the lever. As the same condition does not exist on the north bridges no indicators are provided for the south-bound distant arms. There are four track repeater indicators operated from the automatic circuits to indicate when the routes are occupied and the switches locked up. In this group are three screw releases for releasing the electric locking, one release serving for the middle track in both directions.

The tower switchboard is of the General Railway Signal Company's type having an ammeter, light switches, polarized relays and differential cutout, with colored lights to indicate trouble. The current for operating the plant is taken from 57 cells of storage battery, with a capacity of 240 ampere hours. In addition to operating the signal and switch movements and the interlocking machine, current is also used for lighting all signal lamps and for the lights in the tower. The battery is charged twice a week for eight hours each day, with an overcharge about once a month. The current for charging is generated in a small charging station adjoining the tower. This small station is shown in the illustration. A 9 h. p. Fairbanks-Morse gasoline engine drives a direct-current generator of 5.25 k. w. capacity, delivering 30 amperes at 175 volts, at 350 r. p. m. The charging plant has a switchboard containing ammeter, volt meter, rheostat and differential cutout.

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Maintainers will often find it very advantageous to store a small quantity of supplies in battery wells or other secure places along their sections. A battery copper or a few bond wires securely tucked away where they can be found quickly and in the dark if necessary, will often save a delay when it is least expected. This, however, does not mean to make every relay box a catch-all for scrap wire. Nothing is more pernicious and a loose wire in such a place is sure to short-circuit a relay sooner or later. But if discretion is used a shelter of any kind can often be made to serve two purposes in this manner. The maintainer who has a place for everything and keeps everything in its place and insists that all the apparatus under his jurisdiction be clean and in order at all times, after the manner of a well regulated fire station, is the one to whom such little precautions as the above will be the most useful.

## SPECIFICATIONS FOR VITRIFIED CLAY CONDUITS, SINGLE AND MULTIPLE DUCT

*Signal work is one of the latest, and, perhaps, one of the largest, fields in which conduit is being used. The following specifications, taken from the best practice, and representing a general average of the requirements of telephone, lighting, power, and railway companies in the United States will undoubtedly be found very valuable as a guide in the purchasing of conduit for signal department purposes.*

The quality of the materials used and the methods of manufacture, handling and shipment, shall be such as to ensure for the finished conduit the properties and finish called for in these specifications. The manufacturer must make sure that all material and work are in accordance with the specifications before the conduit is delivered.

The inspector for the purchaser shall have the power to inspect and reject any material or conduit before loading which fails to satisfy the requirements of these specifications.

### GENERAL.

Conduits furnished under these specifications shall be single duct, or two, three, four, six or nine multiple duct, as specified by the purchaser.

### MATERIAL.

All conduits shall be made of finely ground, compact clay, thoroughly vitrified, and shall be free from stones and pebbles. The conduits shall be uniform in size and quality.

The inspector for the purchaser shall be allowed to test for absorption the average run of conduits offered for shipment by completely immersing a number of average samples for 24 hours in water at a temperature of from 60 to 80 deg. F. Conduits showing an average absorption not over 5 per cent to be accepted for shipment.

### DIMENSIONS.

Length.—The length of all conduits, unless otherwise specified by the purchaser, shall be as follows:

Single duct, eighteen (18) inches.
Two duct multiple, twenty-four (24) inches.
Three duct multiple twenty-four (24) inches.
Four duct multiple, thirty-six (36) inches.
Six duct multiple, thirty-six (36) inches.
Nine duct multiple, thirty-six (36) inches.

Diameter of Hole.—All duct holes shall be at least three and one-quarter (3¼) inches in diameter, unless otherwise specified. Measurements of square duct shall be between parallel surfaces.

Wall.—The walls of all single conduits shall not be less than one-half (½) of an inch thick at their thinnest part.

The outer walls of all multiple conduits shall not be less than five-eighths (⅝) of an inch thick at any part, and the inner walls or web shall not be less than seven-sixteenths (7-16) of an inch thick at their thinnest part.

### SHAPE AND FINISH.

Ends and Corners.—All conduits shall be reasonably symmetrical both on the outside and in the duct holes.

The ends of all conduits shall be perpendicular to the sides. All duct holes shall be beveled at the ends. All ends shall be practically smooth and free from projections. The interior corners of all duct holes and the exterior edges of the conduits (except the ends) shall be slightly rounded.

Alignment.—The duct holes for single conduits shall be well centered. No conduit shall be twisted nor bent in more than one direction, nor bent in one direction on edge. A straight edge laid lengthwise on the concave side of a conduit three (3) feet in length shall not show an offset greater than three-eighths of an inch. The allowable bow in short lengths shall be proportionate to the limit specified for three (3) feet lengths.

Cracks.—Cracks in the walls or web of multiple conduit