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Interlocking Plant at Ashford, N. Y.

A Mechanical Installation Containing Work of an Unusual Degree of Excellence and Permanence

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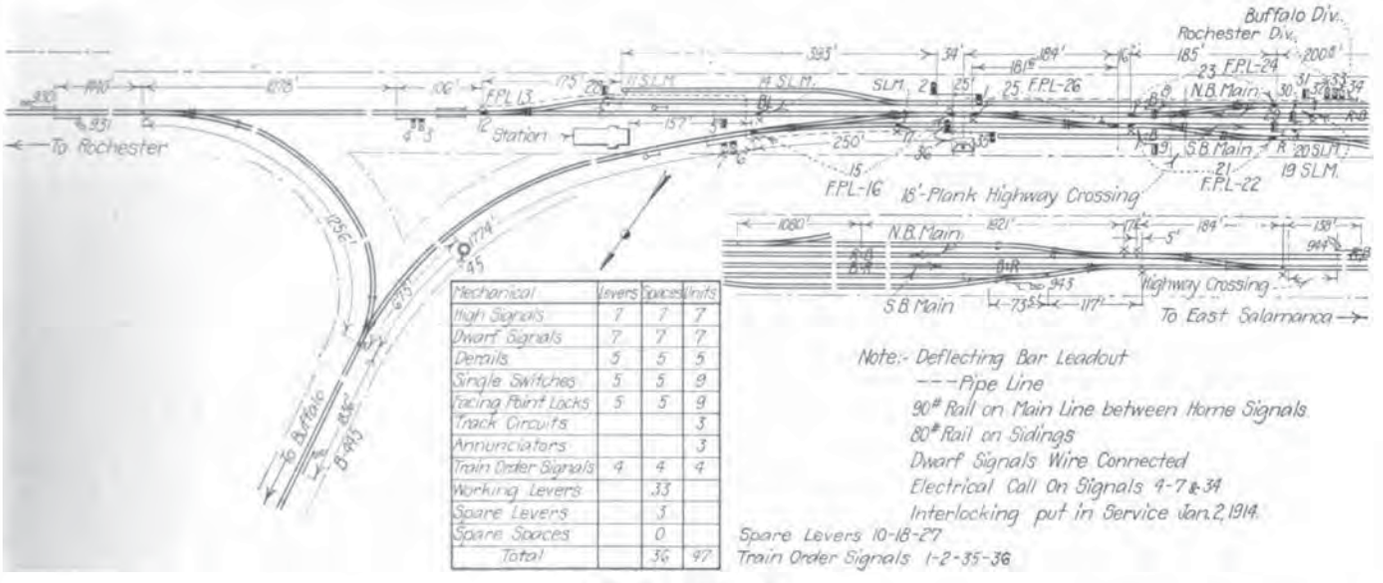
The Buffalo, Rochester & Pittsburgh has recently completed and put in service at Ashford, N. Y., a mechanical interlocking plant which is worthy of special note owing to the attractive concrete tower, the excellent construction of the plant, as a whole, and the neat and orderly appearance of the track, roadway and station grounds.



Mechanical	Levers	Spaces	Units
High Signals	7	7	7
Dwarf Signals	7	7	7
Derails	5	5	5
Single Switches	5	5	9
Facing Point Locks	5	5	9
Track Circuits			3
Annunciators			3
Train Order Signals	4	4	4
Working Levers		33	
Spare Levers		3	
Spare Spaces		0	
Total		36	47

Fig. 1. Track Plan.

The plant is situated at the junction of the Buffalo and Rochester divisions, and was installed to control, safeguard and expedite train movements at this busy point.

The installation comprises:

7 levers for 7 power-operated high signals.
4 levers for 4 pipe-connected train-order signals
7 levers for 7 wire-connected dwarf signals.
5 levers for 5 pipe-connected derails.
5 levers for 9 pipe-connected switches.
5 levers for 9 pipe-connected facing point locks.

33 levers controlling 41 functions.
3 annunciators.
6 indicators.
5 track circuits for route locking.

The plant is in automatic block signal territory, and electric locks, controlled by track circuits, are used instead of detector bars to prevent improper operation of facing-point lock levers.

The signals, appliances and accessories conform to the standards recommended by the Railway Signal Association. The construction materials are almost entirely metal and concrete, which insure substantial, permanent work, and materially reduce the cost of maintenance.

The daily traffic passing through the plant consists of 42 scheduled trains, of which 16 are passenger and 26 freight. The number of extra trains varies considerably, but an approximate daily average is 12. There is also considerable switching at this point.

TRACK LAYOUT.

The arrangement of tracks, switches, derails and signals is shown on the track plan, Fig. 1. The lines from Buffalo to Ashford and Rochester to Ashford are single track; extending southward from the junction the line is double track.

The north end of crossover 15 is normally lined up for southward Buffalo division trains, and the south end of the crossover for northward Rochester division trains. Switch 12 leads to passing siding used by southward trains, and the turnout from this siding is used as a storage track. The turnout in the rear of dwarf signal 31 is used as a bad-order track. Southward Rochester division trains are diverted to the southward main track by way of crossover 23. Crossover 21 leads to the passing siding used by the northward trains, and the turnout from this siding is used as a storage track.

Fig. 2. View of Tower.

The location of high-speed derails 14 and 17, high signals 3 and 4 and dwarf signal 5 is somewhat unusual, as these functions are so placed that it is possible for southbound trains on either division to make station stop and for engines to take water without interfering with train movements in the plant or to the unoccupied main line. The northbound home signal is a three-arm cantilever signal, of which the top arm, 32, governs movements to the Rochester division; the middle arm, 33, governs movements to the Buffalo division, and the bottom or calling-on arm, 34, governs all low-speed northbound movements.

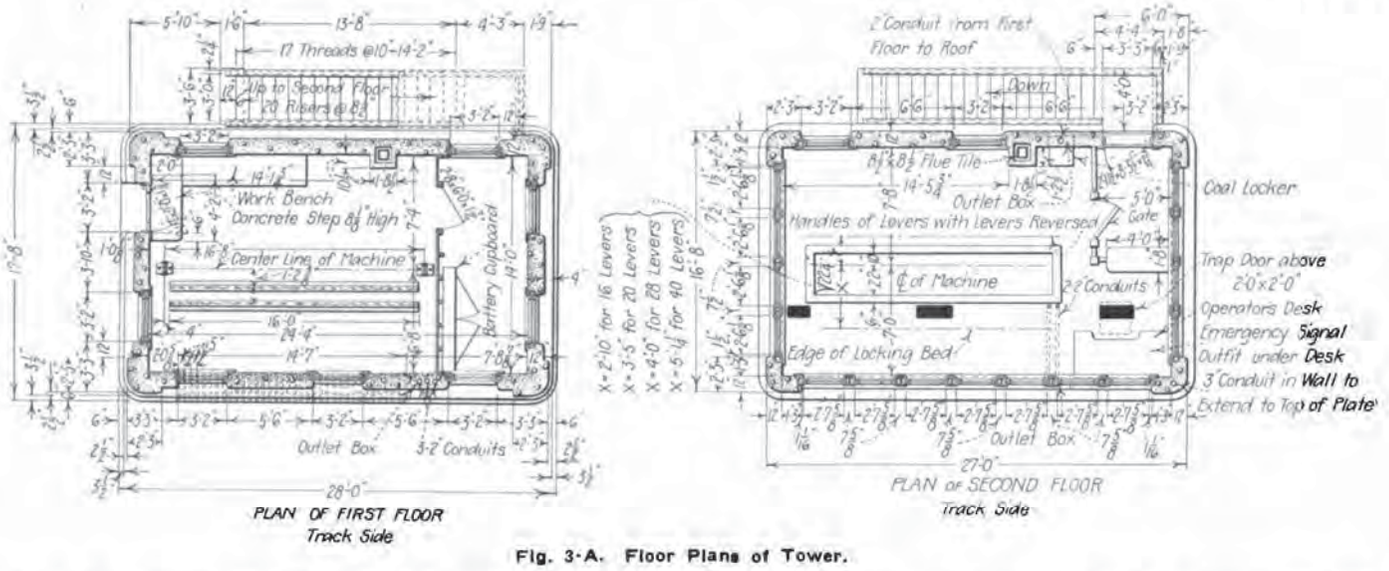


Fig. 3-A. Floor Plans of Tower.

TOWER.

The tower is not merely a housing for the interlocking apparatus and operator, but an attractive structure which adds to the appearance of the station grounds.

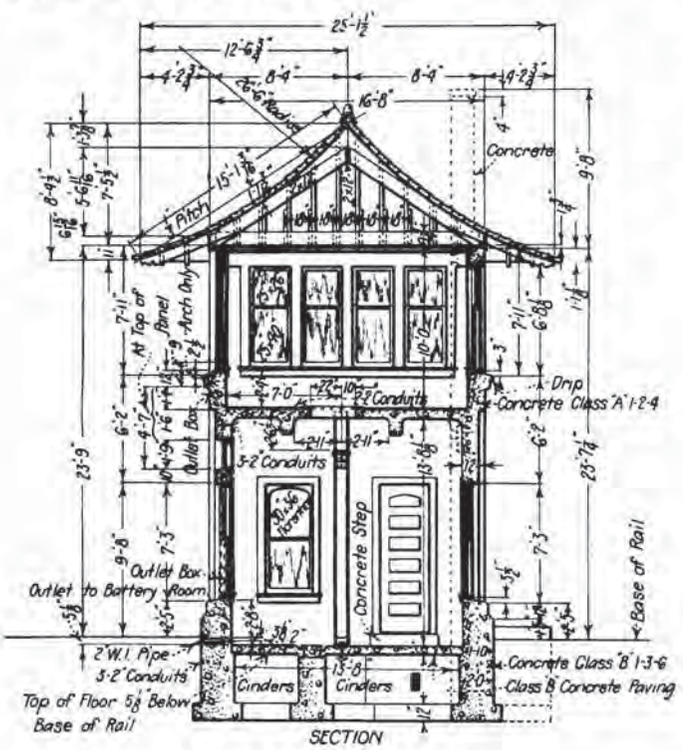


Fig. 3-B. Section of Tower.

The tower is constructed almost entirely of concrete, the upper floor and stairway landing being reinforced concrete slabs. The roof is Imperial Spanish tile. A steel stairway at the back of the tower leads to the upper story. The ample window space in the upper story affords a clear view of the tracks in each direction. The construction details are shown in the accompanying illustrations.

The lower story contains the leadout connections, wire terminals, battery room and work bench. The upper story contains the interlocking machine, indicators and annunciators, screw releases, operators' table and telephone train dispatching and telegraph equipment, clothes lockers for the operators, and a railing enclosed space where trainmen receive orders, messages, etc.

The indicators and annunciators are mounted in a cabinet which is suspended from the ceiling over the middle of the machine, where the indicators can be easily seen by the operator. The manipulation chart is also suspended from the ceiling and hangs immediately over the indicator and annunciator cabinet.

The tower was designed in the chief engineer's office and constructed by the master mason's forces. The total cost was approximately $3,200.

MACHINE.

The machine is a 36-lever vertical leadout Saxby & Farmer type, manufactured by the General Railway Signal Company, and has 33 working levers and three spare levers. The facing-point lock levers are equipped with full-reverse electric locks, high-signal levers, with half-reverse electric locks, and calling-on signals with circuit controllers. The machine is supported by a steel framework composed of I-beams as shown in the plan, Fig. 5. The locking bed has 36 bars.

Fig. 4. Upper Floor of Tower.

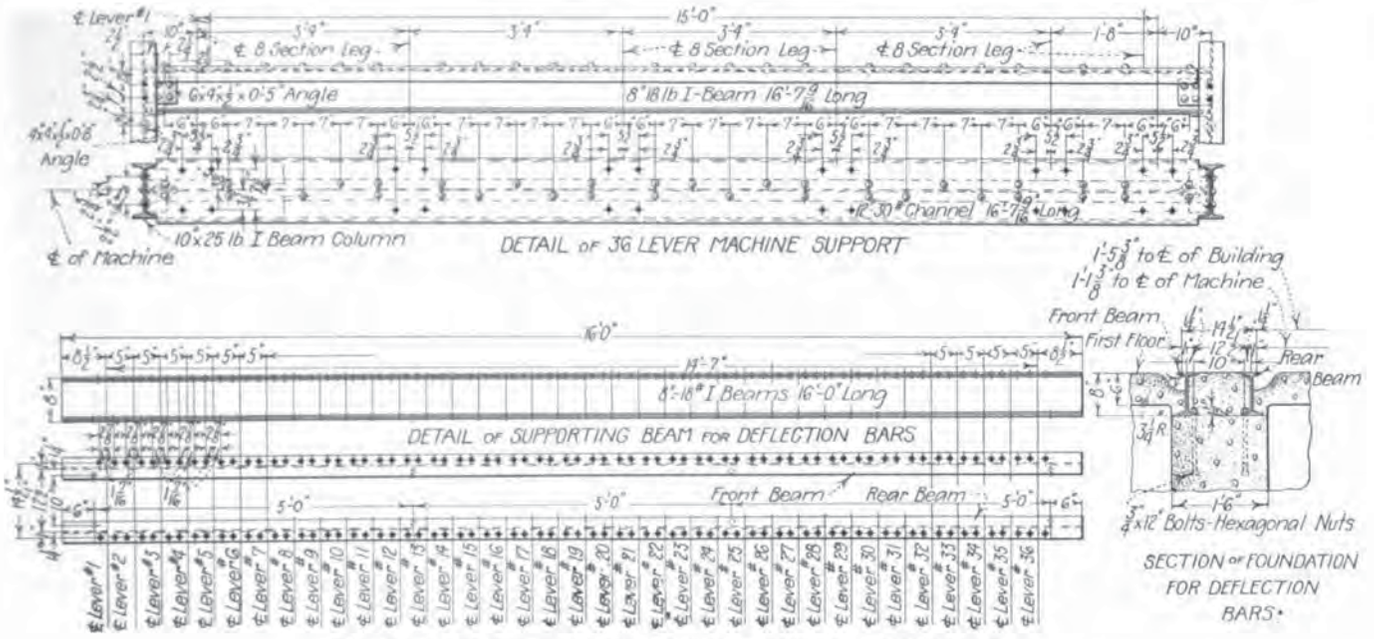


Fig. 5. Detail of Supports for Machine and Vertical Deflecting Bars.

TRANSMISSION.

Leadout.—The leadout is of the deflecting bar type. The vertical deflecting bars are attached to I-beams placed in the concrete floor. The up and down rods are 1½ in., extra heavy, galvanized iron pipe, which was used instead of providing intermediate supports, which would be necessary with standard 1-in. pipe.

Short pieces of 2-in. pipe, placed in the forms while the front wall of the tower was being constructed, provide openings through which the pipes and wires extend, and reduce to a minimum the open space through the wall.

The horizontal deflecting bars are the General Railway Signal Company's adjustable type, and are bolted to ⅝-in. wrought iron plates, which are attached to and supported by I-beams placed in concrete foundations. The advantages of this arrangement are extreme rigidity, and the fact that the leadout may be easily changed as conditions require.

Vertical chain wheels are attached to bolts which were placed in the floor of the tower when concrete was laid. Horizontal chain wheels are bolted to the ⅝-in. wrought iron plates which support the horizontal deflecting bars.

To provide sufficient space for pipe lines passing under tracks, two ties were removed and the opening bridged by heavy channels placed longitudinally under the rails.

Pipe Lines.—Standard 1-in. galvanized iron pipe, plugged and riveted in accordance with R. S. A. specifications, was used in the pipe lines, which are supported by Universal EZ pipe carriers bolted to Universal malleable tops and fastened with hook bolts to standard 8 by 10 by 24 in. concrete foundations spaced 7 ft. apart. The distance from the near rail to the first pipe of the pipe line is 4 ft. 4 in., and the base of the rail is level with the top of the foundation.

Horizontal adjustable deflecting bars were used, wherever possible, in changing the direction of pipe lines. Cranks, compensators and deflecting bars are bolted to cast-iron piers set in concrete foundations. Solid jaws were used in making connections to cranks. Compensators and deflecting bars and a pipe-adjusting screw was placed in each pipe line as close as possible to function operated.

Wire Lines.—The operating wires of dwarf signals are No. 8 B. W. G. galvanized steel wire, supported by wire carriers attached with stove bolts to oak stakes spaced 15 ft. apart. Six-inch horizontal chain wheels are used where there are angles in the line. These chain wheels are bolted to cast-iron piers set in concrete foundations. The wires leading to signal 28 pass through the station platform in ½-in. galvanized iron pipe filled with oil, which is retained in the pipes by stuffing boxes. Each wire passes through a separate oil pipe.

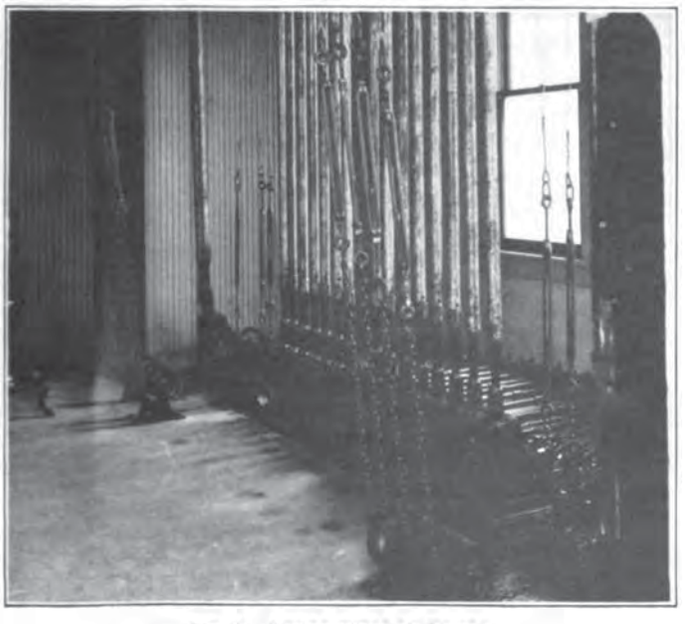


Fig. 6. Lower Floor of Tower.

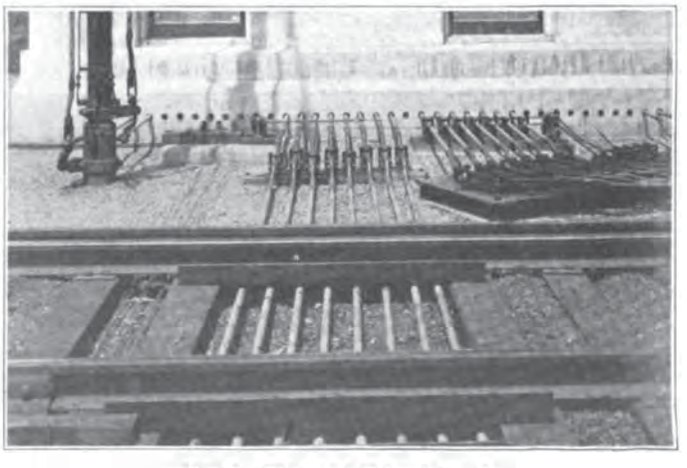


Fig. 7. Pipe and Wire Layout.