

argument that it is impossible to hold the members together in a city, is entirely disproved.

The annual dinner of the association Wednesday evening was presided over, gracefully, by President A. W. Johnston. With the usual accompaniment of good music there were interesting addresses. Mr. J. H. Clarke, general counsel of the N. Y. C. & St. L. road, spoke of the relations of the railways to the law. Mr. W. McNab, principal assistant engineer of the Grand Trunk, enlightened a sympathetic audience regarding the great Dominion of Canada. Dr. W. A. Evans, commissioner of public health of Chicago, welcomed the association to the city. Dr. C. S. Howe, president Case School of Applied Science, of Cleveland, spoke in justification of technical schools, taking the recent attack of Mr. Crane rather more seriously than such a screed, which is its own best answer, deserves. Rev. R. A. White, one of Chicago's best after-dinner speakers and most public-spirited citizens, closed a pleasing and profitable program.

The gathering of the clans was augmented on Tuesday and Wednesday by other attractions. The meeting of the Western Railway Club, the letting of car contracts and a meeting of the mechanical officers of the Harriman lines, brought the mechanical engineering men and higher officers of manufacturing establishments to the city; while the technical schools were also largely represented. There were, therefore, an unusual number of pleasant reunions; and the discussions in the lobbies were perhaps not the most unprofitable to all concerned.

#### Western Railway Club.

The regular monthly meeting of the Western Club was held at the Auditorium hotel, Chicago, March 17. There were two subjects for discussion: 1st. Elements Affecting the Strength of Structural Timber, by Prof. W. K. Hatt, professor of civil engineering and director laboratory for testing materials, Purdue University. 2nd. The Problem of Freight Operation, by Prof. Ernest R. Dewsnup, professor of railway administration, University of Illinois. The first paper was illustrated by stereopticon views. The committee on revision of the rules of interchange appointed at the February meeting of the club asks if any of the members have any changes or additions to suggest that they send them to the office of Joseph W. Taylor, secretary, 309 Old Colony building, not later than March 25.

Congressman Burton, of Cleveland, has presented a bill to prevent the disclosure of information concerning interstate shipments of any firm, person or corporation by common carriers, their officers, agents or employees or persons having access to their records, to another firm or corporation. Violations are to be made a misdemeanor, punishable by a fine not exceeding \$1000 nor less than \$200 for each offense. It has been charged that the Standard Oil managed to get the better of independent operators by securing inside information concerning shipments and destination of shipments of oil shipped by the independents.

The Interstate Commerce Commission has issued an order requiring common carriers to make monthly reports of all instances wherein employees have been on duty more than nine consecutive hours.

The Oriental Limited of the Great Northern Ry. was held up near Bonners Ferry, Idaho, March 15, by a highwayman. Both mail clerks were bound while the mail car was rifled. No estimate is made as to the amount of the booty, but it is not believed to be heavy. The bandit escaped.

A passenger train of the Interborough Rapid Transit subway in New York City was stalled with the power off and the lights out in the new tunnel under the East river for nearly an hour on March 17. The delay was due to a fire in the Fulton Street station under lower Broadway, originating from a short circuit of the third rail. In fighting

the flames it was necessary to cut off the power from the line, halting one train midway in its passage beneath the river and causing considerable uneasiness among the passengers who were left during the interval in total darkness.

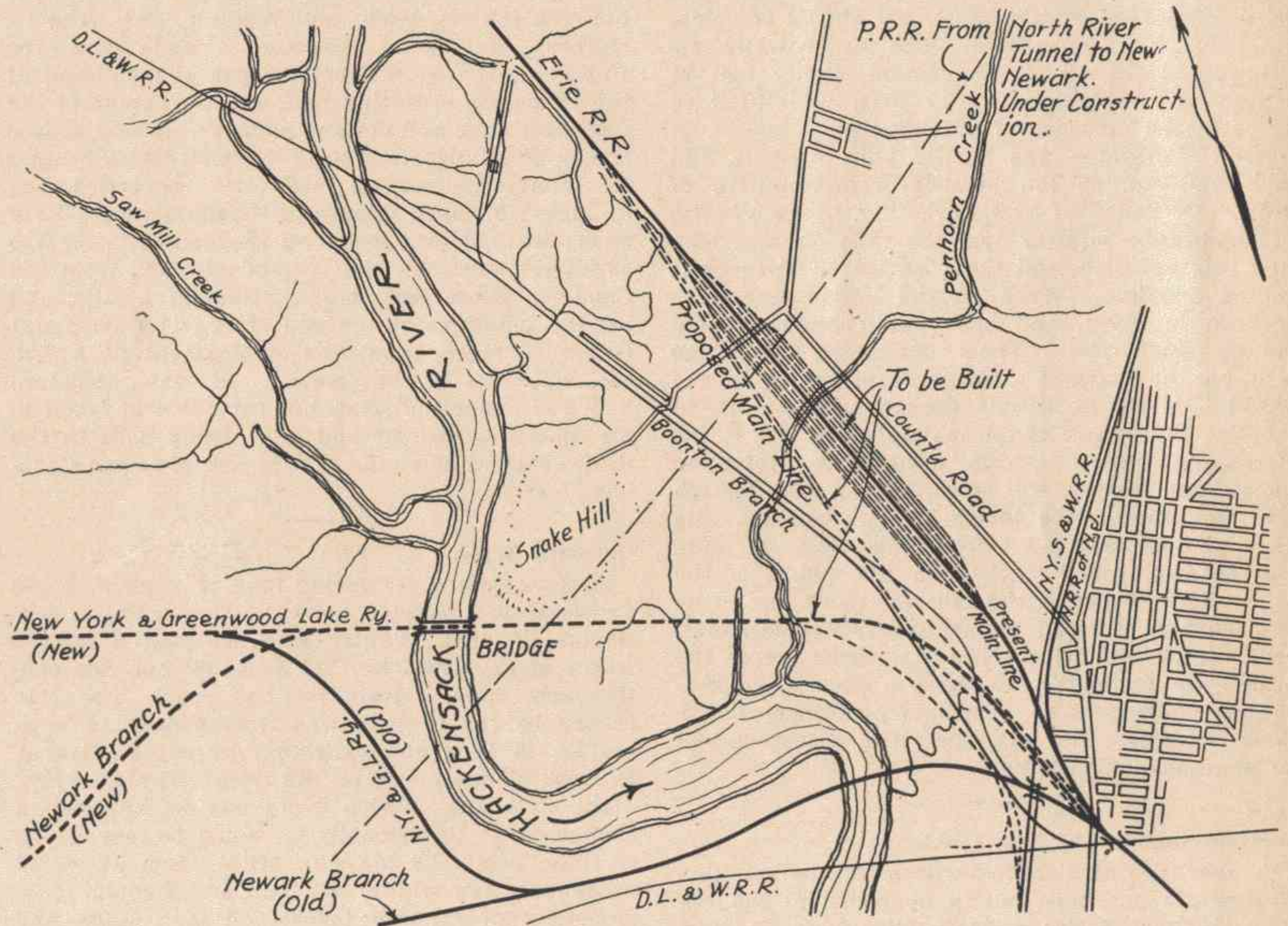
The last of the four tunnels of the Pennsylvania Railroad under the East river, at New York City, has been connected. The two shields, which have approached each other from opposite sides, touched about midway under the river and the tunnel gangs broke down the thin intervening wall of earth and shook hands. The work of lining and concreting the steel tube will be expedited.

At Columbus, Neb., March 13, Judge Thomas directed a verdict against the state in the case in which Dr. Martin, a local physician, was being

the architect, engineer or owner who desires the highest obtainable efficiency in steam heating. The pamphlet calls attention to the 4000 installations of the Webster system already made, in every conceivable character of building.

#### Hackensack River Bridge, Erie R. R.

At the present time the Greenwood Lake and Newark branch lines of the Erie Railroad cross the Hackensack river at its nearest point to the limits of the city of Hoboken after the river has taken a sharp turn to the east from its previous generally southerly course. The Greenwood Lake line leaves the Newark branch at some distance to the west of this crossing and follows the bend of the river. The old line of the New York & Greenwood Lake Ry., now a part of the Erie system, originally crossed the



Map Showing Location of Hackensack River Bridge, Erie R. R.

prosecuted for accepting a pass from the Union Pacific railroad. It was shown that Dr. Martin had an indeterminate contract to do the medical work of the road at Columbus for \$25 a month and an annual pass. The prosecution claimed a violation of the law because the physician does not give a majority of his time to the railroad.

The International General Foremen's Association holds its annual convention in Chicago, May 25 to 29 inclusive. The railway supply men have formed an organization for exhibition and entertainment purposes, as follows: Mark A. Ross, chairman executive committee, with Fred. Baskerfield, Frank Raymond Spear and W. O. Duntley, members; Edmund H. Walker, chairman entertainment; J. Will Johnson, secretary and treasurer.

The Pennsylvania Lines are co-operating with the Ohio College of Agriculture, in running a "Farmer's Corn and Alfalfa Special" from Lancaster, O., to Morrow, making a number of stops for forty minute lectures to farmers. The announcement says: "Nothing to sell or advertise. This train is being run for the benefit of the farmers of this section, and it is hoped that your town will be fully represented. Farmers are invited to bring their seed with them that it may be tested as to quality."

Warren Webster & Co., Camden, N. J., are sending out their new catalogue describing the Webster system of steam circulation for heating purposes. It is intended to give a clear understanding of what this system will do, and how it does it, presenting the subject in an interesting manner to

in connection with the Erie's open-cut and other improvements in this section it was considered advantageous to relocate the new bridge at this point. The general relations of the old and new lines and the location of the bridge now under construction are shown upon the accompanying sketch map. When the improvement is completed the Newark branch and Greenwood Lake lines will separate at a point just west of the bridge. The proposed main line is located for some six miles from the Jersey City terminus a little to the southwest of its present location and between this new line and the New York, Susquehanna & Western new yards are under construction.

The new bridge, of which the substructure is now partially completed and of which the superstructure will probably be in place by the middle of the coming summer, will consist of six plate-girder deck spans and a draw span. The deck spans are, in order from each approach to the deck span, 78 ft. 6 ins., 78 ft. 3 ins., and 79 ft. 3 ins., respectively, and the draw span is 264 ft., making the total length between abutment back wall faces 736 ft.

The abutments and piers are of concrete on pile foundations. Underneath the bed of the river a rock bottom was found at depths varying from 75 ft. west of the pivot pier to 95 ft. east of the pivot pier, below Jersey City datum, which is 3.9 ft. below the level of mean low water and 8.8 ft. below mean high water.

Piers Nos. 3 and 5 may be taken as typical of the construction. Each of these is supported on 114 piles—19 longitudinally of the pier and 6 in

width—spaced generally three feet and driven to refusal. The piles are of yellow pine and the specifications required that they should be not less than 15 ins. in diameter at a point two feet from the butt and with points not less than 6 ins. in diameter. The piles forming the foundation of the two piers named and of the pivot pier were sawed off 19 ft. below datum, those under the abutments at datum and the intermediate piles at 16, 11.5 and 7.5, according to the depth of the river bottom. The grillage consists of five courses of 12x12 in. timbers, thus bringing up the base of the concrete work to elevation—14 for the pivot and adjacent piers. The pivot pier is carried upon 225 piles—15 in each direction—spaced 2 ft. 9 ins. and carrying a grillage as above specified 42 ft. square. The concrete of the pivot pier is carried vertically to a height of 5 ft., 38 ft. square. From this point the pier is conical, of a diameter of 36 ft. 3 ins. at the base and battered 1 in. in 1 ft. up to the coping, 18 ins. in depth. The top of the pier is sloped from a point 3 ft. from the center to the inner edge of the coping ring, which is 5 ft. in width. At this point the inclined surface is 6 ins. in depth and the slope is continued in drainage holes opening to the exterior just under the edge of the coping. The base of the coping is 6 ins. above

draw span is rim-bearing. The depth of the radial girders is 4 ft.

The structure was planned and is being erected under the supervision of the construction department of the Erie Railroad, J. M. Graham, vice-president, F. L. Stuart, chief engineer. It is expected that the bridge will be completed and in operation about June 1.

Meeting of the Railway Signal Assn.

The regular March meeting of the Railway Signal Assn. was held at the Great Northern hotel, Chicago, on the 16th inst. There were both forenoon and afternoon sessions, and a large attendance. President A. H. Rudd occupied the chair during the first session and Vice-President L. R. Clausen during part of the afternoon.

The forenoon was occupied in discussing the report of committee No. 8 on "Standard Specifications for Electric Interlocking," beginning with Section 60. As the result of the discussion the committee was instructed to make certain changes in its report before it is brought up for final action and adoption at the annual meeting in October. The report as far as considered, and as it now stands in revised form, reads as follows:

61. Mechanical Connections. The mechanical connections for switch mechanism shall be arranged in accordance with Contractor's standard practice, unless otherwise provided.

Strength of connections shall be such that switch points can be stopped by placing an obstruction between point and stock rail at any part of movement without breaking or bending any such connections.

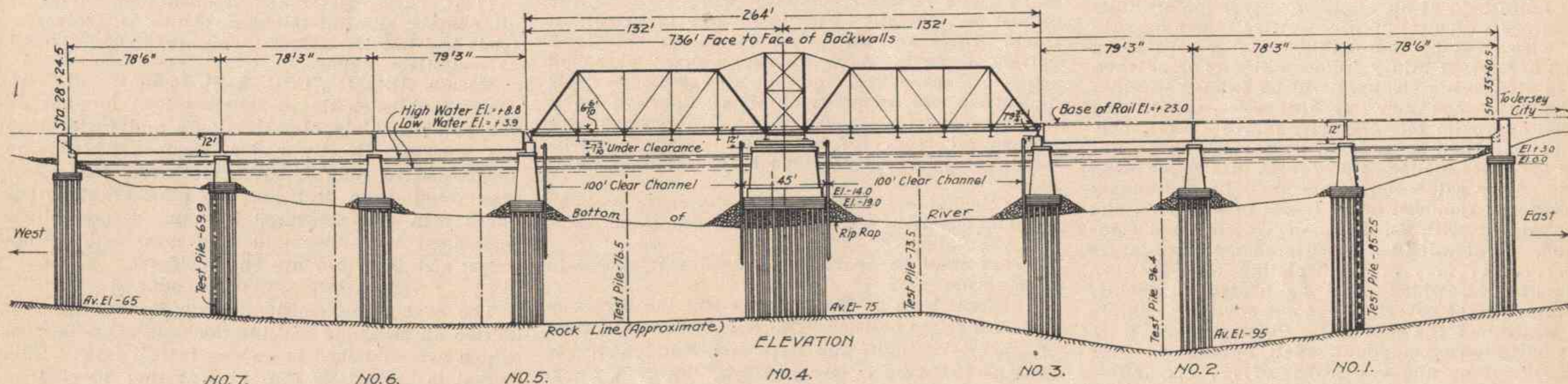
Connections shall be strong enough to prevent bending or breakage in case mechanism is operated when detector bar is engaged by wheels of a car or engine.

All ties whose relative location affects the correct operation of mechanism shall be securely strapped together.

62. Detector Bars and Detector Circuits. Detector bars will .....be required. Detector bars shall be located as shown on plan, be fifty (50) feet in length and formed of three pieces, bolted together. Outside bars shall be made 1/2-in.x2 1/4-in. section, with beveled edge.

Fifty foot detector bars shall be mounted on 16 .....type rail clips and a proportional number of clips shall be used for shorter sections.

Bars shall rise a minimum of 3/4-in. above top of rail at every point, and shall reach their maximum height above rail during the unlocking of



General Elevation of Hackensack River Bridge, Erie R. R.

the line of mean high water. The piers are symmetrical about the center line of the bridge, being nosed at an angle of 45 degrees both up and down stream.

On Piers 3 and 5 seats for the draw are formed 5 ft. in width and 5 ft. 9 ins. in height above the level of the top of the body of the pier upon which the deck spans are seated.

The fenders for the pivot piers are on piles spaced 4 ft. 7 3/4 ins. on the outside and two rows of intermediate piles spaced at twice the distance. Clamps 6x12 ins. connect each alternate pair of outer piles and are bolted to the intermediate piles, and the diagonal braces, of the same dimensions, cover each three bents and are bolted to the outer and the intermediate piles. The nose of the fender is formed of a cluster of seven piles and two rows of piles extending at angles of 45 degrees back to the body of the fender and spaced 3 ft. apart, with a cluster of nine piles at the intersection of the body and nose. Beyond the clearance line of the draw span the fender rises 5 ft. higher than the body. The sheathing is 6x12 in. planking fastened by 7/8-in. bolts and carried 10 ins. below the line of low water.

The protection for the rest piers consists of a wall of piles double-sheathed extending for 72 ft. along the channel face of the pier and terminating at each end in a triangular fender 20 ft. deep and 35 ft. long of piles clamped, braced and sheathed as described in connection with the pivot pier fender toward the channel and protected by clusters of piles, 9 at each outer apex and 15 at each corner of the pier. The clear channel between fenders is 100 ft.

The contractors for the substructure were McMullen & McDermott, Park Row building, New York.

The superstructure will be fabricated and erected to the railroad's specifications by the American Bridge Co. The material is soft open hearth steel. The deck girders are 8 ft. 6 ins. in depth with ordinary angles, cover plates and bracing. The draw span will have a clearance of 28 ft. in width and 24 ft. 6 ins. clear height above base of rail. The

60. General.

Switch mechanisms shall perform their normal operation in the following sequence:

1. Unlock switch.
2. Throw switch.
3. Lock switch.
4. Indicate.

Motors shall be of sufficient capacity and mechanism constructed to perform complete operation of switch in not more than four (4) seconds with battery at ten (10) per cent below normal voltage.

Mechanisms shall be so constructed and equipped that the switch can be stopped or reversed at any point of movement by manipulation of lever controlling same.

Mechanism shall be equipped with an efficient friction clutch to prevent damage to same in case movement of switch is obstructed. If friction clutch fails to release motor, all parts of mechanism shall be strong enough to permit of stopping the switch at any point of its movement by introduction of an obstruction between point and stock rail, without injury to any part.

Switch lock rod shall be locked by a plunger of minimum sectional area of two (2) square inches, arranged in such manner that switch shall be fully locked before an indication can be obtained.

The hole or notch in lock rod shall be not more than one-sixteenth inch larger than plunger, measured in a horizontal line.

When the lock rod is moved 3-32 inch out of the lock position, locking plunger shall engage a minimum area one-sixteenth square inch. Ends of locking plunger must be squared.

Field coils of motors and all other magnet windings of mechanism shall be securely held to effectually prevent vibration.

Switch mechanism shall be protected by substantial iron covers, fastened to ties or mechanism with wrought or malleable iron fastenings, in a manner to permit of convenient inspection of mechanism.

The location of switch operating mechanism shall be as shown on .....Plan No ..... Dated .....attached hereto.

All parts of mechanisms and covers shall be placed outside of clearance limits, as shown on diagram on .....Print No. ....Dated .....attached hereto.

the switch; shall be mounted substantially and operate close to head of rail in a plane inclined toward center of track.

When practicable detector bars shall be so connected that the unlocking movement when switch is in the main line position shall be in the reverse direction to the facing movement over the points.

Unless otherwise specified, bars on curves shall be located on the outside rail.

Bars on opposite side of track from mechanisms shall be operated by two (2) inches square rocking shafts, with bearings securely bolted to ties.

Fifty feet of continuous detector bar protection shall be installed at and for each point or pair of points.

Detector Track Circuits.

Detector track circuits will.....be required in addition to (lieu of) detector bars.

Detector.

When track circuits are required, they shall conform to the following specifications:

Note.—Detail specifications to be given here for results required of track circuits as to control of switches, etc.

63. Switch Circuit Controllers.

Circuit controllers of substantial construction and positive in action shall be provided for each switch mechanism.

Circuit controllers shall be positively connected to operate from both points of all switches.

Operating rods of switch circuit controllers shall be 1 inch in diameter, adjustable, and supported every 3 ft.

Wire and Wiring.

70. Specification.

All wire shall conform to the standard specifications adopted by the Railway Signal Association.

71. Size.

All wires shall be of sufficient size to permit operation of switch and signal mechanism in accordance with previous specifications.

Rubber covered wire smaller than No. 14 B. & S. shall not be used.

Copper line wire smaller than No. 10 B. & S. shall not be used.

72. Tagging.

All wires shall be tagged at all junction boxes, switches, signals, relay boxes, arrester boxes and at all line wire connections.

All tags shall be made of vulcanized sheet fibre,