

### NEW YORK CONNECTING RAILWAY: HELL GATE BRIDGE OVER THE EAST RIVER.

The huge 1,000 feet arch span that is to be built over the East River at Ward's and Randall's Islands in connection with the New York Connecting Railroad, will be the largest structure of the kind yet built. The accompanying illustrations, reproduced from the designers drawings, show the general appearance of the proposed bridge, and at the same time give some idea of the magnitude of the undertaking.

Mr. Samuel Rea, vice-president of the Pennsylvania Railroad Company, through whose courtesy the illustrations herewith are shown, has submitted the plans for the bridge to the Municipal Art Commission of New York City, in accordance with the franchise granted to the company. This bridge will join the belt line now building around Brooklyn from Bay Ridge on the harbor, with the Harlem River branch of the New York, New Haven and Hartford Railway. It will form part of a steel viaduct more than three miles long. With a sweeping curve the viaduct will pass over Hell Gate, Ward's Island, Little Hell Gate, Randall's Island and Bronx Kills.

This immense arch will be 200 feet longer than the Niagara Gorge Arch, and is designed to carry much heavier loads.

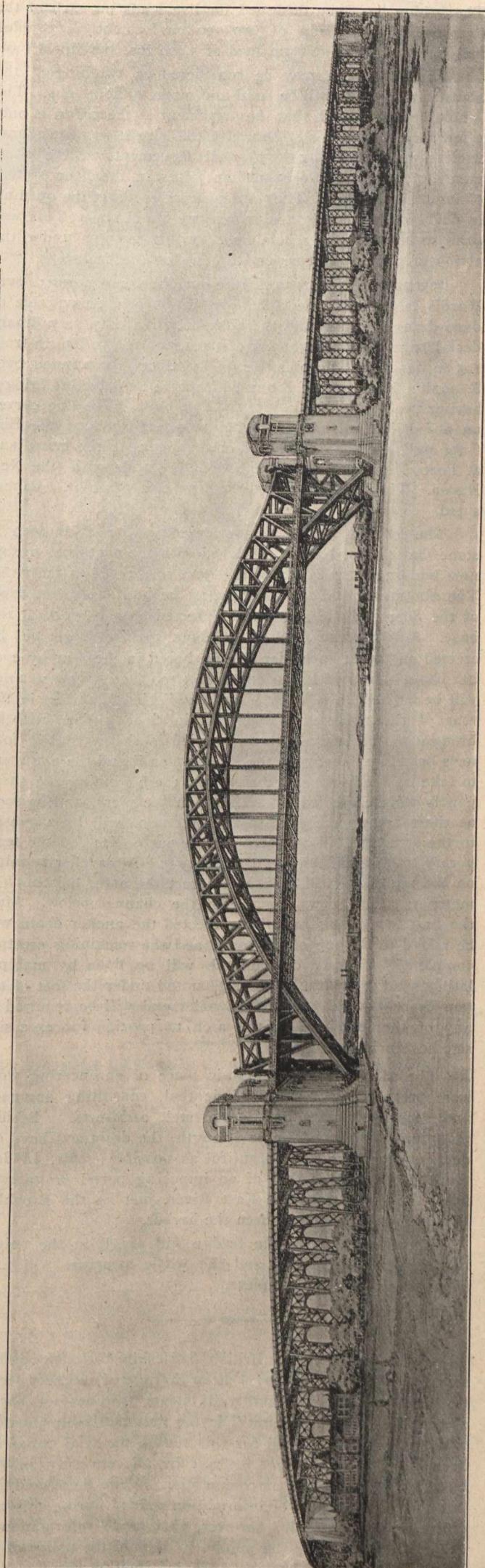
Upon completion of the undertaking New York City will, for the first time, have an all-rail route between New England and the South and West. Through trains may then run from any southern or western city without leaving the rails. Heretofore cars for through trains have been ferried around New York from the Bronx to Jersey City.

The south approach of the bridge is in Queen's County, Long Island. It is composed of a number of reinforced concrete arches and plate girders over the numerous intersecting streets, and the intermediate sections consist of an earth fill having heavy retaining walls of concrete. At one street crossing about 135 girders are required. The approach to the main arch is a steel viaduct consisting of a plate girder superstructure, which is supported on steel rocking towers about 75 feet apart. Concrete stability piers filled with gravel are placed about 800 feet apart, and to these the floor stringers are anchored. At the center of the distance between these piers expansion joints are provided. The design includes no roller bearings or other moveable supports.

The main arch is flanked on each side by the abutment piers, which are carried up 200 feet in the form of double towers. These will be of massive proportions and elaborately ornamented above the deck. They will rest on compact gravel and hard pan, the bottom of the foundations being above the high-water line, and will therefore, be much less expensive to build than would foundations for any other type of bridge requiring piers in or close to the water. The part below the springing line of the arch will be granite-faced masonry, and above that finished concrete. The main body of the piers will be hollow and filled with earth and stone to provide sufficient weight to counteract the horizontal thrust of the arch.

The arch will be 300 feet high at the crown, with a clear waterway under the floor of 140 feet. The panels are of uniform length, 42 feet 6 inches. At the crown the depth of 40 feet was imposed by the conditions of the design and similarly the height at the portal was that required for the end bracing and head room over the tracks. The peculiar but very symmetrical reverse curve of the upper cord resulted from the determination of the height of the intermediate panels to provide a uniform increase in the compressive stresses in the bottom chord from crown to abutment. Ample wind bracing is provided between the arch trusses, which are spaced 60 feet, center to center, as well as in the floor system.

The floor system consists of deep plate girder stringers under each rail and crossbeams at each post, interlaced with diagonal bracing. There will be four tracks, two for passenger and two for freight trains, with material platforms between. The rails will be laid on ties embedded in 15 inches of stone ballast, laid on a floor of 8-inch creosoted and caulked timbers. This construction will be used throughout on the metal superstructure of the main arch and approaches.



Proposed Bridge of the New York Connecting Railroad over the East River at Ward's and Randall's Islands.