

HARBOR AND DOCK IMPROVEMENTS

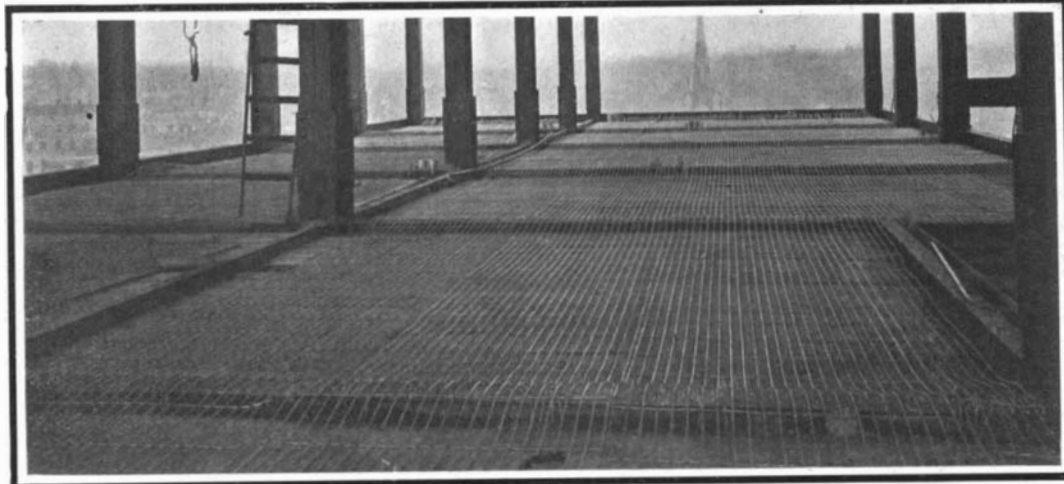
The commanding position held by the port of New York on the seaboard of the United States is shown by the fact that out of a total foreign commerce of the United States of \$3,581,000,000, \$1,613,000,000 represents the foreign trade of the port of New York alone. These are the figures for the year 1907; and the money value of New York's foreign commerce translated into tonnage means that no less than 13,000,000 tons of freight passed in or out of the harbor entrance at Sandy Hook, and was handled at the multitudinous docks which line the far-reaching shore line of the city.

The proud commercial position held by New York, as shown by the fact that the city handles nearly one-half of the nation's foreign commerce, is due to its commanding geographical position and to the unusual extent and excellent character of its harbor facilities. The total frontage of the city on the water is 444.80 miles, and of this 125.10 miles is available for shipping. The available frontage is divided as follows: 5.33 miles is used by the various steam railroads; 3.61 miles is devoted to foreign steamship service; 3.11 miles to domestic steam service; 23 miles of frontage is owned by the United States government; the various parks of the city have a frontage of 23 miles; and 47.28 miles of frontage may be described as miscellaneous.

In an analysis of the accommodations of the port of New York for water carriers in relation to railroads, warehouses, and the active business of the city, dealing with the North River south of Seventy-second Street, and the East River south of Forty-fourth Street, it was recently shown by Mr. W. G. Wilgus that fourteen of the piers are devoted to railroads, exclusive of ferries; thirteen piers to the accommoda-

disparity between the magnificent scale upon which the office buildings, bridges, tunnels, and waterworks of this city have been built, and the flimsiness and generally disreputable appearance of many of the docks and pier sheds, is something which astonishes every observant engineer who visits this city from abroad.

In making this criticism, however, we hasten to pay tribute to the excellent character of the work done on the new docks and pier sheds, which have been built of late years by the Department of Docks



WELDED WIRE CLOTH AND CONCRETE SYSTEM OF FLOORING USED IN THE FLOORS OF THE NEW CITY DOCKS.

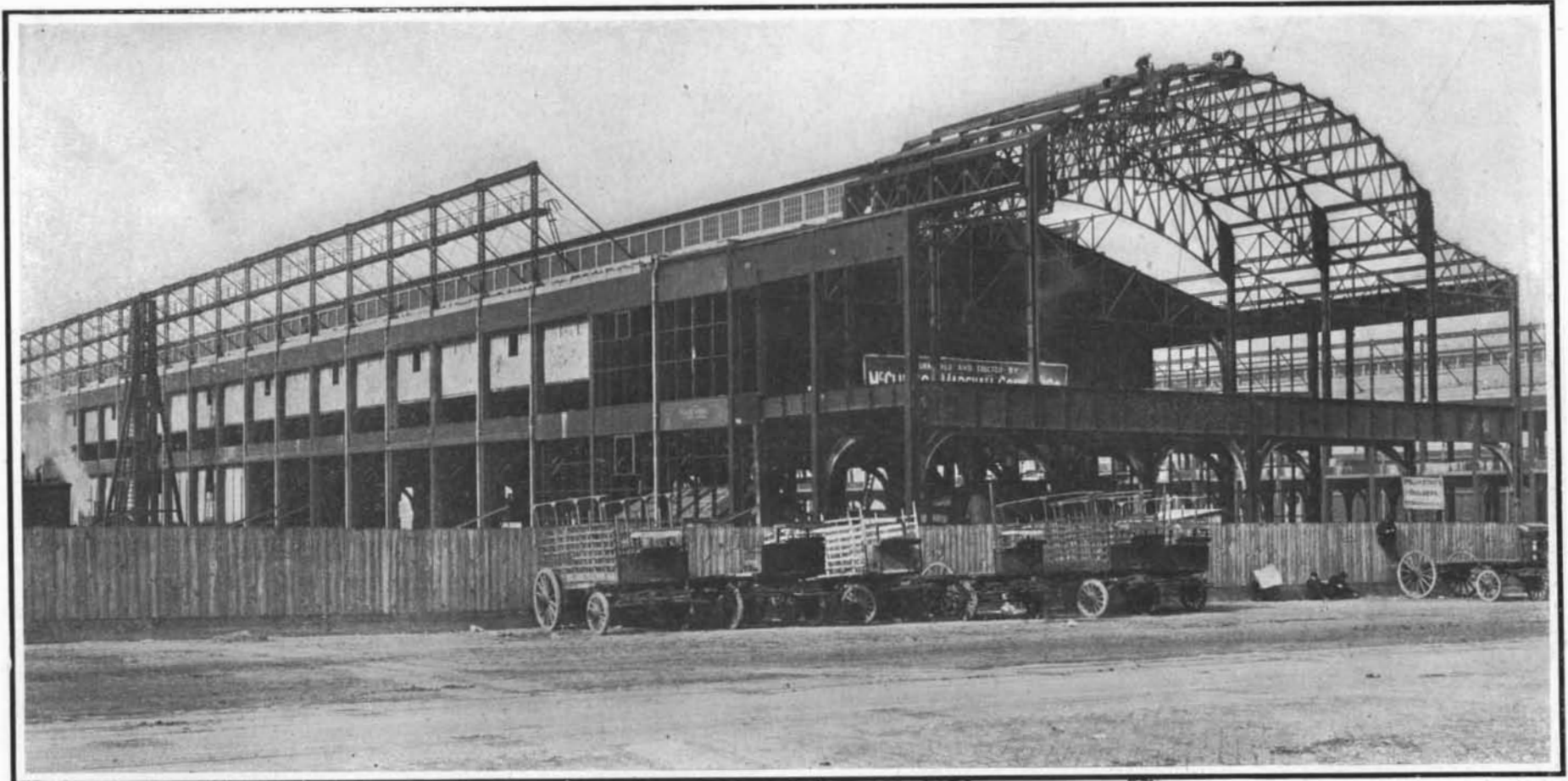
and by some of the leading steamship companies. Particular credit is due to the German and other foreign steamship companies for the handsome docks which they have built during the last decade along the Jersey shore of the Hudson River at Hoboken. The Department of Docks also has reason to be proud of the long stretch of new docks and pier houses extending north from Christopher Street. The size of these last-named piers, and the excellent character of the double-deck sheds erected upon them, are fully commensurate with the dignity of the great port of New York.

We present illustrations of Pier 56, one of several now being built by the Department. It is 100 feet wide, 825 feet long, and is covered for its whole width by a two-deck steel-frame pier shed of absolutely first-class

armored concrete, and above this a finishing layer of asphalt. The pier-shed building is of thoroughly fireproof construction, the framework of the walls, floors, and roofs being of steel, and the floors and the roof covered with armored concrete. This armored concrete is of what is known as the Clinton welded-wire type, in which the necessary tensile strength is afforded by embedding in the concrete a heavy wire mesh, made of steel wire drawn under a tensile strain of 60,000 pounds per square inch. Of late years it has come to be recognized that the value of steel wire reinforcement in concrete depends upon the quality of the bond between the wires at their intersections, and between the surface of the steel and concrete. Where the bond is imperfect, there would be a tendency to movement between the adjacent materials and, of course, such movement means an enormous loss of strength. In the ideal armored concrete, there should be no movement of the steel in the concrete, nor of the separate members of the steel reinforcement in regard to one another, and this is particularly true of wire-mesh reinforcement as used in slab flooring. To guard against such movement, the Clinton wire cloth is welded at every intersection. This

has the double advantage of preventing movement of the wires upon one another, or movement of the whole mesh within the mass of inclosing concrete. The combination of concrete deck, floor, and roof with walls of structural steel covered with corrugated iron, provides an absolutely fireproof construction, and this fact, taken with the broad dimensions and lofty headroom of these piers and sheds, renders them comparable with the best construction at the first foreign seaports.

The last report of the Bureau of Construction and Repair, dated September 10, 1908, shows the vessels building for the United States navy to be in the following state of completion: Of the new battleships, the "South Carolina," building by William Cramp &



This view represents one of several new piers built by the Dock Department. They are 100 feet wide by 800 feet long. The pier sheds, constructed of steel and armored concrete, are thoroughly fireproof.

NEW PIER SHED OF PIER 57, BUILT AND OWNED BY THE CITY.

tion of foreign steamships; twenty-three piers are used for coastwise, river, and Sound lines; twenty-two for ferry purposes; and fifteen for municipal purposes.

It must be confessed that much of the pier and dock construction of the city falls lamentably below the standard for a port of the vast importance of New York. This is particularly true of the older docks, ferry houses, pier sheds, etc., built at a time when capital was not so plentiful, and engineering construction was hampered by considerations of economy. The

construction. The substructure of the pier is of the prevailing type in New York harbor, being carried upon piling driven into the silt of the river bottom to a firm foundation, the piling being heavily cross-braced in both directions. The lines of piles down the sides of the dock are cut sufficiently lower than the piles under the body of the dock to allow of the placing of a side cap. Above the piles are placed the cross caps, and above these again are the rangers, or stringers. On the stringers are laid two thicknesses of creosoted planking. This is followed by a layer of

Sons, was 58.1 per cent completed, and the sister ship "Michigan," building by the New York Shipbuilding Company, was 65.1 per cent completed. Of the two 20,000-ton "Dreadnoughts," the "North Dakota," building by the Fore River Ship and Engine Building Company, maintains its long lead over the "Delaware," building by the Newport News Company, the "North Dakota" being 50.1 per cent, and the "Delaware" 40.5 per cent completed. The five new destroyers are from 20 to 49 per cent completed, and the seven new submarines from 46.8 to 55.7 per cent completed.