This Bridge is a Record-Breaker

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Unless in the immediate future some of the magicians of science spring a surprise upon the world, the new East river bridge, thrown from Manhattan to Brooklyn, will be the first great record-breaker of the twentieth century. It will, when finished, mark the climax of achievement in bridge building. In many respects it will be one of the most remarkable structures of its kind in the world. As a suspension bridge it will stand unrivaled, and as an engineering feat only one bridge can approach it, its near neighbor, the Brooklyn bridge. Indeed, the latter is the only suspension bridge in the world to be compared with it, and to give some idea of the magnitude and ambition of the new bridge some comparative figures between it and the old will form the best illustration.

The greatest contrast between the two lies in their relative strength. Roughly, the new East river bridge will be four times as strong as the Brooklyn bridge; each of its four cables will be about twice as stout as those which support the span of the older structure, and in other respects its superiority in strength will be maintained.

Strength of the Cables.

Each of the four cables will consist of thirty-seven strands, and each strand will have 282 single wires, a total of 10,434 wires in each cable. The normal pull on each cable will be about 5,000 tons, and as each will be capable of supporting 200,000 pounds to the square inch, and will have 222 square inches, net, the engineers calculate that the suspension power of the bridge will be four times greater than the maximum demand upon it.

The width of the new structure will be 118 feet, as compared with the eighty-five feet of the Brooklyn bridge, and the character and amount of its traffic accommodation will be proportionately greater. It will have six railroad tracks, two carriage ways, each twenty feet wide, two-foot walks, and as concessions to the growing tastes of the public, two bicycle paths.

In actual channel span the two bridges will not present a great difference, merely a matter of four and a half feet, but in the total length of the span the new bridge will claim the record by 1,200 feet. The Brooklyn bridge has a channel span of 1,595½ feet and a total length of 6,000 feet. The figures of the new bridge are respectively 1,600 feet and 7,200 feet.

The steel towers of the new bridge are about fifty-nine feet taller than the masonry spires of Brooklyn bridge. The cap of the steel work from high water is 335 feet; similar measurements on the Brooklyn bridge give a height of 276 feet. The minimum height of the bridge for 200 feet on either side of the center above mean high water of spring tides is 135 feet; the Brooklyn bridge has the same height, but only at the central point.

Daring and Delicate.

The work of building this bridge is a work of daring and enterprise, complicated and full of the most delicate detail. It has brought forth the display of the greatest skill in engineering and the perfection of mechanical appliances. From the sinking of the stone piers to their bed of rock, 115 feet below the water level, to the spinning in mid-air of the mighty cables, the work has been performed, with unerring precision and fidelity. The sinking of these piers was done in a depth of sixty feet of water and presented a difficulty real and hazardous.

The stretching of the cables from tower to tower will be an affair of the greatest labor and niceness. It would be hard to present the delicacy of this operation to the lay mind, but a conception of it may be given when it is said that these enormous cables will have to be twisted, two tiny wires at a time, high in mid-air. The preparations for spinning those cables are now under way; the four solid steel saddles, each weighing thirty-five tons, over which the cables will pass, are in place at the top of the towers, and all is being made ready to sling the first wire. But before that can be done a sort of minor bridge—but one which, by the way, will cost $200,000—will have to be erected, and from this the work of constructing the cables will go on.

This footbridge will consist of a suspended structure of three spans, one of 1,000 feet between the two towers, and two of nearly 600 feet each between the towers and granite anchorage. The middle span will virtually consist of two narrow parallel double-deck bridges, sixty-seven feet apart on centers, and connected by cross bridges 160 feet apart. Making the connection between the towers for this foot bridge is an interesting operation in itself. Contrary to precedent in such cases the first bond of union is a heavy cable, weighing over twelve tons, and not a thread or light line as was used in the Brooklyn and other suspensory bridges.

Here is how the connection was made: The end of the wire rope, two and a quarter inches in diameter and three thousand feet in length was attached firmly to the anchorage on the Manhattan side. The other end was then passed over the tower on the Manhattan side and down to a flat boat at the edge of the water. On this flat boat the free end of the cable was fixed, and a tugboat started slowly on the trip across the river, the cable being carefully reeled off, so as to sink toward the bottom of the stream, between the flat boat and the side of the river on which it was attached, that it might not impede navigation during the time that the cable was being pulled across the stream. When the cable had been stretched across the river the unattached end was passed up over the Brooklyn tower and the line hauled from the bed of the river and drawn taut till the loose end reached the anchorage on the Brooklyn side.

Details of the Cables.

With the completion of the temporary bridge will begin the stretching of the cable proper. The necessary wire for the main cables is now in the course of manufacture at Trenton, N. J., and will be three-sixteenths of an inch in diameter, and, as I have already said, will be capable of sustaining a strain of 200,000 pounds to the square inch. Each wire will be made 4,000 feet in length and will be shipped to the bridge site on drums. In each cable there will be 10,000 wires, laid straight and parallel to each other, which will be first grouped into strands of thirty-six to each cable. Each strand will contain 280 wires and will be temporarily wrapped. When the thirty-seven strands for each cable are made, then the temporary wrapping is removed and the 10,000 wires are grouped together in a cylindrical cable. Each cable will be held in form by heavy clamps of steel weighing about 400 pounds each. These bands will be placed twenty feet apart and will secure the suspenders to the cables. These suspenders are to consist of four strands of one and three-quarter-inch twisted steel wire rope, and to each of these suspenders the end of the floor beams will be attached. The floor beams and the entire structure will be thus suspended from the cables proper by the suspenders. When completed the cables will be sheeted with a casting of sheet steel about one-sixteenth of an inch in thickness, overlapping, in order to shed the water

The operation of cable-making will consist of an endless rope, moved in both directions by a steam engine placed in the construction plane of each cable. This rope passing around sheaves at the anchorage will carry a bight of the cable wire across the river. The loops at both ends will be received on shoes, which will rest on legs several feet from the anchor plus. This arrangement will cause the strand during construction to hang from twelve to sixteen feet above its final position and afford an opportunity to adjust each wire separately to exact parallelism with a standard wire. As the end of one coil is reached, it will be spliced to the end of another coil, and the wire made continuous throughout the strand. The wires in each strand will be lashed together in an approximately cylindrical shape, lowered several feet, and united to form the cable, which will be built in a vertical plane and afterwards moved transversely to give it the required cradling. As explained, during the process of cable-making in previous suspension bridges, including the Brooklyn bridge, the strand wires have all been pulled across from one side of the river and the cable-making has been performed by a limited number of men in traveling cars suspended alongside of the cables. This, however, has been vastly improved upon in the case of the new bridge, where the wires will be pulled across from both sides of the river.

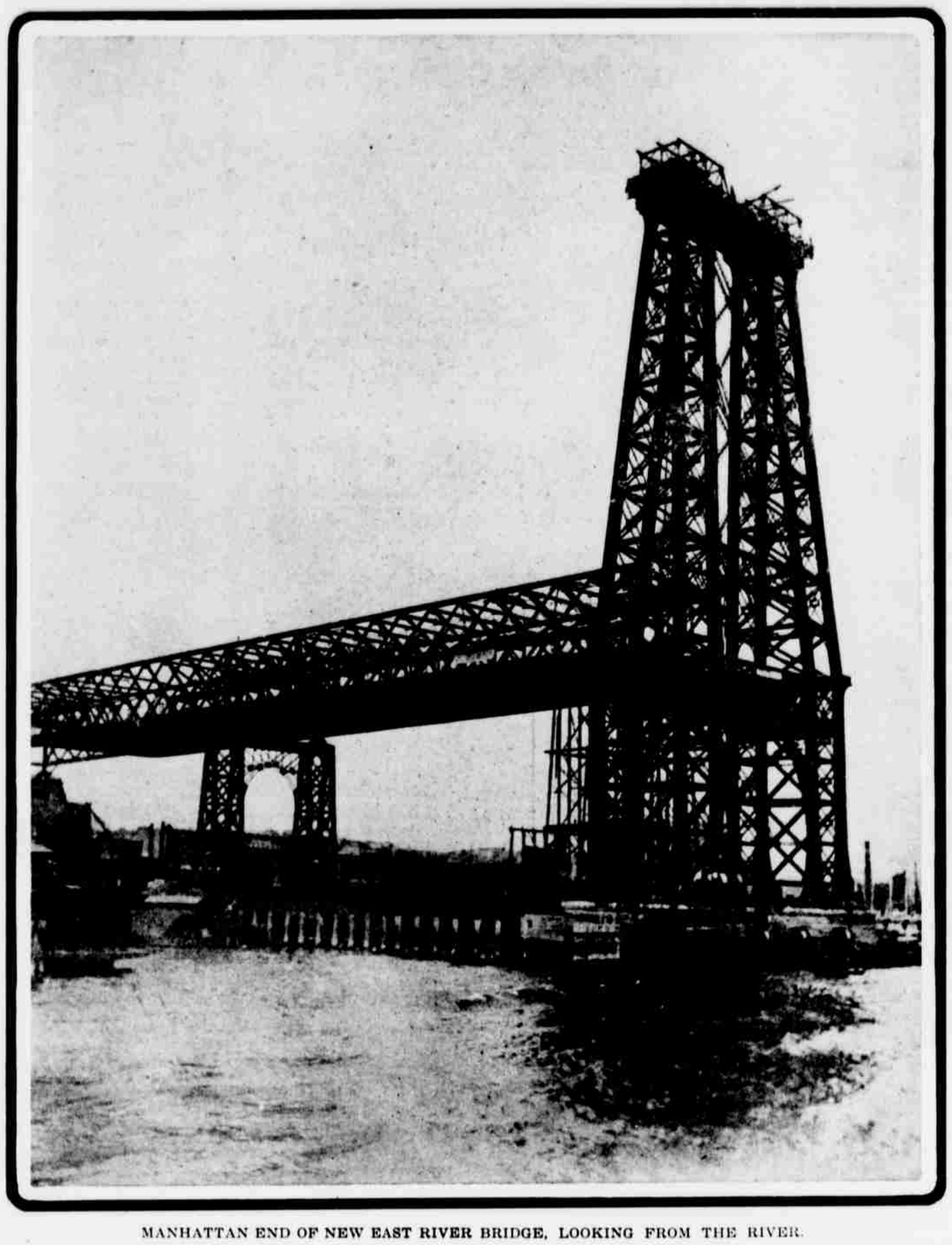
Working from Both Ends.

It has been so arranged that two strands of each cable, or eight strands in all, can be simultaneously made, and a practically unlimited number of men can work on them simultaneously by means of the foot bridges, which form the working platform under each cable for its full length. For this operation four sets of machinery will be required, and these will so expedite the work on the four cables that they will be built more rapidly than ever before thought practicable.

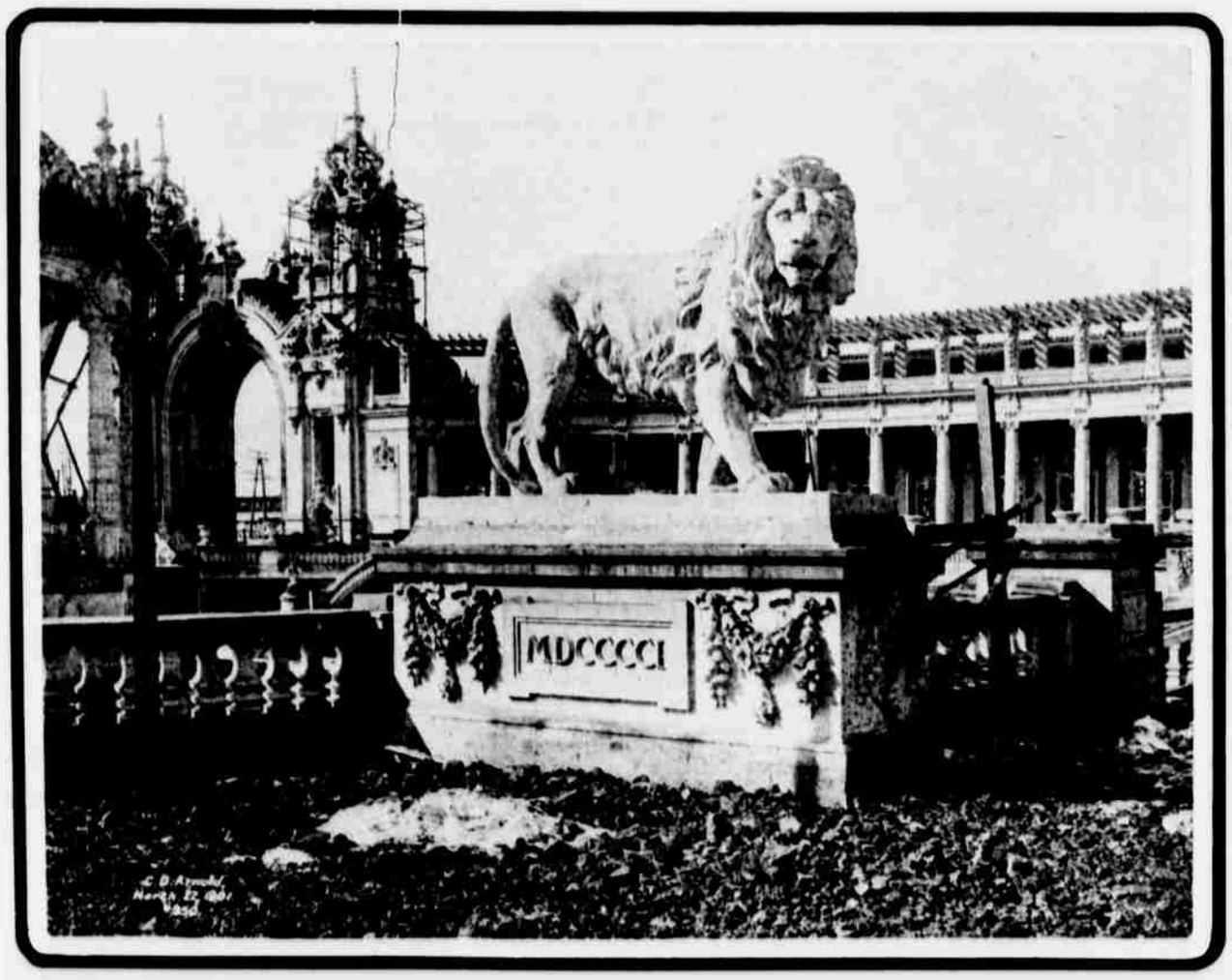
The weather will play an important part in the making of these cables. In calm weather the work can be carried on without interruption, but it will almost entirely cease during high winds. The cables at each anchorage will be attached to the forty steel eyebars, fourteen feet long, which are built in solid masonry. These will be walled in with granite blocks of the same size as those used in building the anchorage, after the cables have been attached.

This new bridge will, indeed, be in every way a remarkable structure, and a striking monument to American engineering genius. There is no space here to speak of its commercial value as an investment by the city of New York, but it will be worth many times the $18,000,000 to be spent upon it.

LEWIS NIXON,
President New East River Bridge Commission.



MANHATTAN END OF NEW EAST RIVER BRIDGE, LOOKING FROM THE RIVER.



LION FOR SUNKEN GARDEN OF PLAZA, WITH PROPYLAEA IN DISTANCE—PAN-AMERICAN EXPOSITION.

Not Too Blind

Miss Walta Webster went to the probate judge at Stockton, Kan., and procured a marriage license for herself and Josiah Thompson. She explained to the judge that Josiah didn't come along because he is blind and couldn't see to do the business. "But he makes $800 a year, even if he is blind," triumphantly added Miss Walta.