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THE SECOND BRIDGE BETWEEN NEW YORK AND BROOKLYN.

Mention was made a fortnight ago of the beginning of work on the pier foundations of the long-promised bridge across East River at Blackwell's Island. To-day we are able to set before our readers an engraved illustration showing the bridge as it will appear when completed, three years hence, if no mishap delays the expected progress of the work. The entire structure will consist of two spans across the two channels of East River, one elevated viaduct across the Island, and two approaches, the whole having together a length of nearly 9,000 feet, or almost 1¾ miles.

The New York approach will begin at the east side of Third Avenue, and traverses block between 76th and 77th streets to the river, a distance of about 3,000 feet. Connection will be made with the east side elevated railways, and with the New York Central and Hudson River Railroad traversing Fourth Avenue. The viaduct will be of similar construction to the high structure of the Metropolitan Elevated Railroad in Eighth Avenue, between the Park and 125th street, both onthe shore ends and on the Island. The bridge spans will be respectively 734 and 620 feet long, and will have a clear height above high water of 150 feet. The design of the spans is of the kind known as trussed chain suspension bridge.

The roadway will consist of two central railroad tracks each 14 feet wide; two carriageways each 9 feet, and two sidewalks each 5 feet wide, all on the same level. The bridge will be proportioned to carry two consolidation locomotives on each track followed by as many heavy freight cars as will cover the spans, and at the same time a general load on the highways and sidewalks of 40 lb. to the square foot. The floor will be designed to carry 100 pounds a square foot. The factors of safety will be three for dead load and eight for live load.

The eight towers which support the chains for the main spans will be made of Phœnix columns, well braced together in every direction. They will be 46 feet long on top, and 90 feet long on the base, and 260 feet high.

The long spans will be, as stated, "trussed chain suspension" bridges, somewhat similar in design to the "Point" bridge at Pittsburg, illustrated in SCIENTIFIC AMERICAN, vol. xliii., page 159.

Instead of there being one cable at a side, as at Pittsburg, there will be two, crossing each other in the center, on a pin joint, and flowing into each other in symmetrical curves, one above the other. The total load dead and live, is equally distributed between the two, and the resulting tension is always sufficient to more than counterbalance any compression resulting from unequal loading, the space between the two being thoroughly braced by diagonal bracing.

A somewhat similar arrangement has been suggested by an English engineer, Mr. Fidler, but in his designs he makes the upper chain straight. Besides the disagreeable appearance of this plan, it would be impracticable to draw the upper chain straight by any force that could be applied, and Fidler's bridge could only be erected by using false walls or staging, which are inadmissible across the East River.

By the plan proposed, however, the chains will be put in place by means of small temporary cables of wire, and will be allowed to take their own curves. The weight of the platform, being attached to the lower chains, half on each side, will draw the opposite upper chains nearly into position, and by temporarily loading the platforms, the chains can be made to take the curves designed for them. The intermediate bracing will then be put in, and the temporary loads removed.

This plan was designed by Messrs. T. C. Clarke and A. Bonzano, Members American Society of Civil Engineers, and, it is believed, overcomes all objection to trussed chain suspension bridges.

The principal contractor for the bridge is Thomas Rainey, Esq., of Ravenswood, L. I. The iron works will be constructed by Clarke, Reeves & Co., of Phœnixville, Pa., who have erected the West Broadway and Ninth and Eighth Avenue lines above the Park of the West Side Metropolitan Elevated system, and the Second Avenue line on the East side, besides many other bridges too numerous to specify.

The total cost of the bridge, including real estate, is estimated at five millions of dollars. and it is believed that it will be ready for traffic by December 31, 1883.

The Corwin's Cruise.

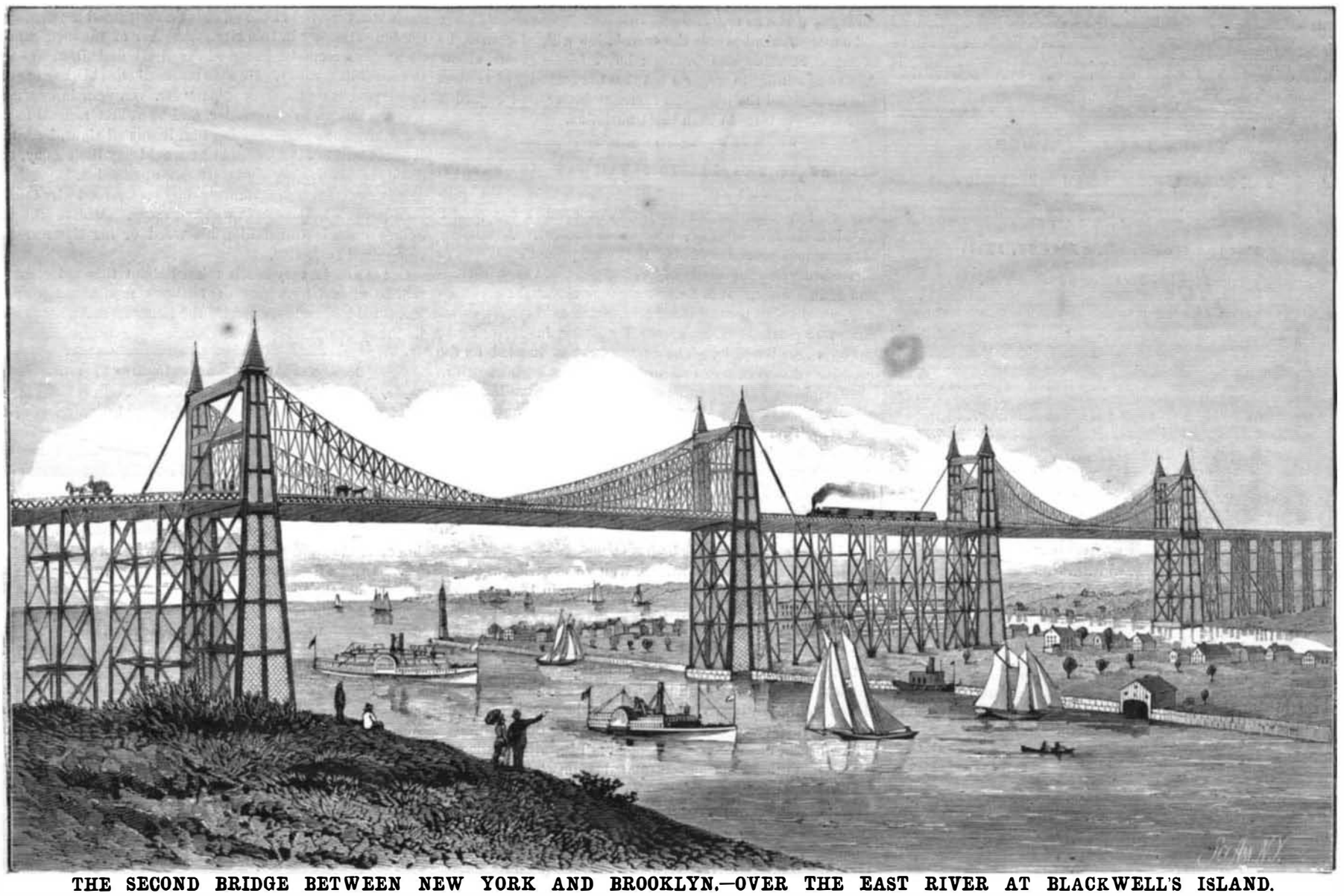
The U. S. revenue steamer Corwin sailed from San Francisco for a second cruise along the northern shore of Alaska, May 4, with the following assignment of officers: Captain, C. L. Hooper, Boston; First Lieutenant, W. J. Herring, New York; Second Lieutenant, E. Burke, Milwaukee; Third Lieutenant, O. B. Myrick, Boston; Third Lieutenant, George H. Doty, New York; Third Lieutenant, William E. Reynolds, Washington; Chief Engineer, James T. Wayson, Baltimore; First Assistant Engineer, Charles A. Laws, Philadelphia; Second Assistant Engineer, Frederick E. Owen, Owego, N. Y.; Surgeon, I. C. Rosse, Washington. There are thirty of a crew and a professional coal miner taken north with the view of working the crew in utilizing the coal ledge discovered during last year's cruise at Cape Thompson.

Captain Hooper's instructions give him great discretionary powers in his search for the Jeannette, and the expedition may winter in the Arctic regions.

A Filler for Porous Hard Woods.

Use boiled oil and corn starch stirred into a very thick paste. Add a little japan and reduce with turpentine. Add no color for light ash. For dark ash and chestnut, use a little raw sienna; for walnut, burnt umber and a slight amount of Venetian red; for bay wood, burnt sienna. In no case use more color than is required to overcome the white appearance of the starch unless you wish to stain the wood. This filler is worked with brush and rags in the usual manner.

Let it dry 48 hours, or until it is in condition to rub down with No. 0 sandpaper, without much gumming up, and if an extra fine finish is desired fill again with the same materials, using less oil, but more of japan and turpentine. The second coat will not shrink, it being supported by the first coat. When the second coat is hard, the wood is ready for finishing up in any desired style or to any degree of nicety by following up the usual methods. This formula is not intended for rosewood, and will not be satisfactory if used therefor.—*T. F. Page, in the Coach Painter.*



THE SECOND BRIDGE BETWEEN NEW YORK AND BROOKLYN.—OVER THE EAST RIVER AT BLACKWELL'S ISLAND.