

SCIENTIFIC AMERICAN

[Entered at the Post Office of New York, N. Y., as Second Class Matter.]

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

Vol. XLVI.—No. 17.
[NEW SERIES.]

NEW YORK, APRIL 29, 1882.

[\$3.20 per Annum.
[POSTAGE PREPAID.]

THE BLACKWELL'S ISLAND BRIDGE.

Few great engineering works have been so favorably conditioned by nature as the Ravenswood Bridge which has been projected and is now in process of construction at Blackwell's Island. Where each abutment is located solid rock is reached a short distance below the surface, and the anchorages at the termini of the bridge on Long Island and at New York are to be secured in forty feet of solid natural rock. On Blackwell's Island the anchorage will be in twelve feet of natural rock and re-enforced by forty feet of solid masonry.

The several sections of the bridge being comparatively short, can be constructed with far less expense proportionately than a bridge having a single long span.

Such great natural advantages as these have not been found in connection with any other bridge in this country or in the world. These natural conditions alone will effect a saving of about ten millions of dollars in excavations and foundations, and shortened spans, all of the work being positive and straightforward; there being no unknown conditions to be developed as the work progresses. In our engraving we show the coffer-dam and breakwater surrounding the excavations commenced at Ravenswood, L. I. The coffer dam is 140 feet long, and 70 feet wide. The breakwater is 162 feet long, and 85 feet wide. The piers are to be 60 feet wide and 120 feet long at the base, and 100 by 40 feet at the top. Each pier will support twelve

wrought iron columns about 24 inches in diameter, made of 2½ inch double refined iron. There are to be three chain cables, as shown in the middle view at the top of the engraving. The bridge together with its approaches will be 10,043 feet long. The bridge spans will be respectively 734 and 618 feet long, and will have a clear height above the water at mean tide of 154 feet.

Two central railroad tracks each 14 feet wide, two carriage ways each 9 feet wide, and two sidewalks each 5 feet wide in the clear, all on the same level, form the roadway of the bridge, which will be 76 feet wide.

The four towers which support the three chains for the main spans are to be made of Phoenix columns well braced in every direction. They will be 46 feet long on the top and 100 feet long on the base, and 260 feet high. The long spans will be trussed chain suspension bridges, something like the Point Bridge at Pittsburg, but with upper chord curved.

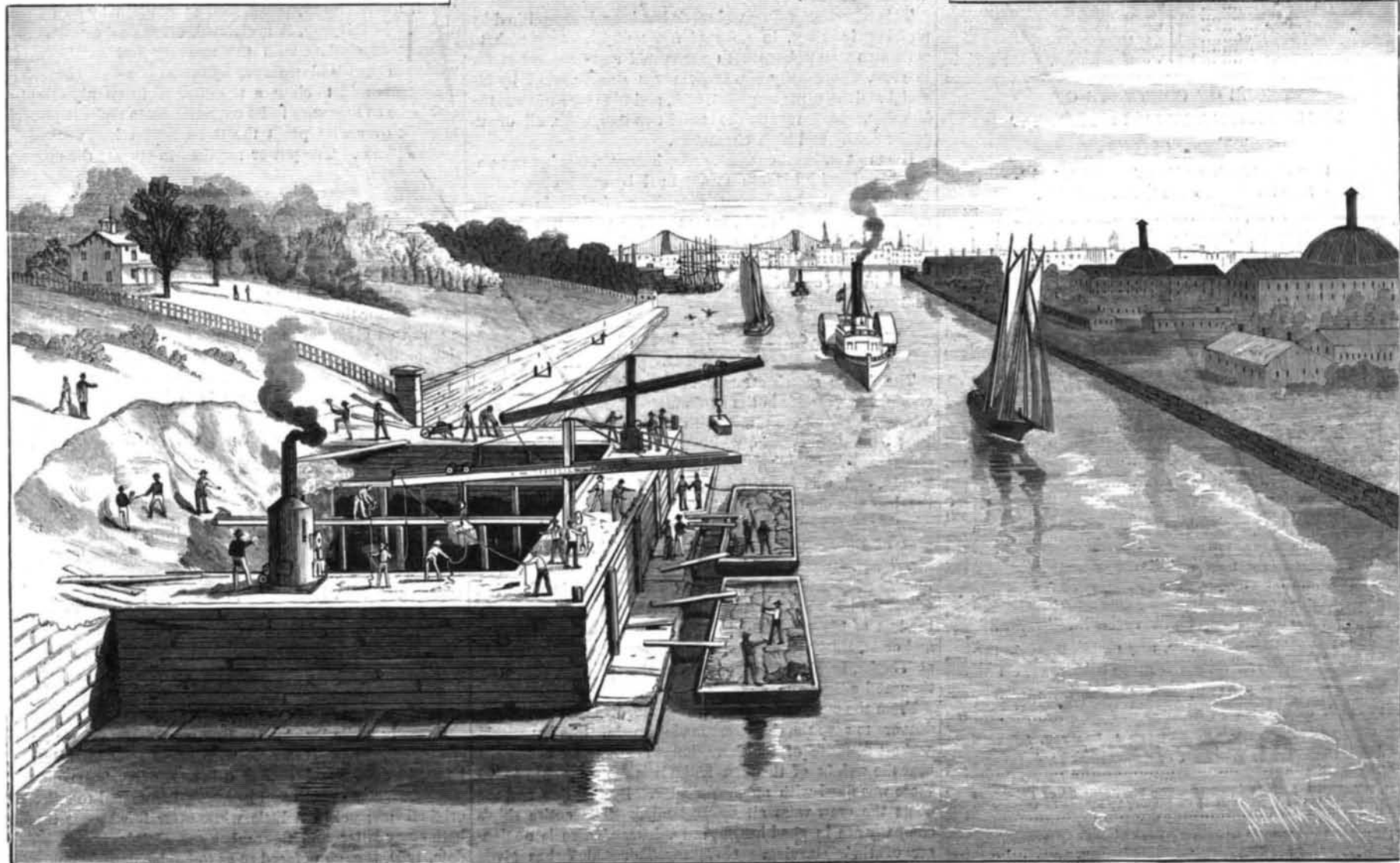
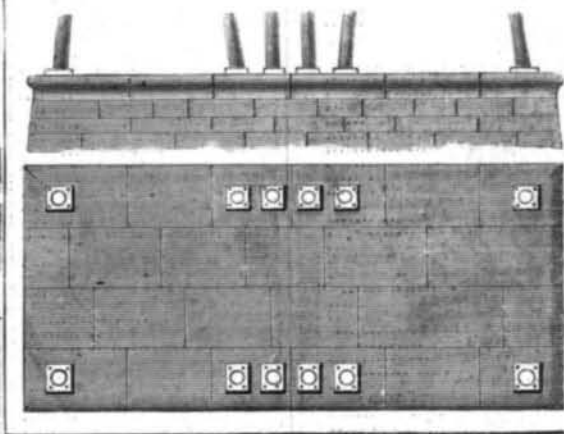
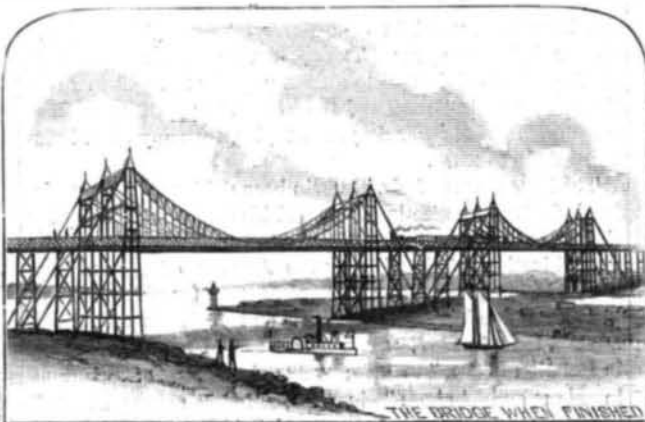
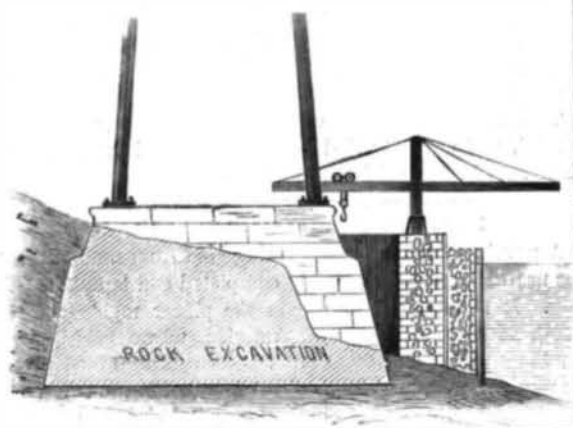
There will be two chain cables at each side, crossing each other at the center on a pin joint, and joining each other by symmetrical curves, one above the other.

The total load is equally distributed between the two

cables, 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 braces. The chains will be put in place by means of small temporary wire cables, and will be allowed to adjust themselves to a natural curve.

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 total cost of the bridge, including real estate, is estimated at six million dollars. The work will proceed actively as soon as the water becomes warmer, probably by the first of June next. It will take about two and a half years to complete the structure. Dr. Thomas Rainey, of Ravenswood, is the contractor and financial manager of the enterprise; and if he succeeds in promptly carrying the scheme through, as is now promised, he will receive the universal and well-deserved praise of the people of Long Island as well as of this city and Brooklyn, all of which it will unite by rapid railway intercourse, for the great and lasting boon which will have been conferred upon them.



PROGRESS OF THE NEW EAST RIVER BRIDGE AT BLACKWELL'S ISLAND.