being anchored down to the foundation; and this feature seems, therefore, inherent in the design.

3. Changes of temperature will tend to move the tops of the piers in the line of the axis of the bridge. This motion, however, will amount to but 1\% inches for the whole range of 150 degrees provided for by the specification, and the piers may bend so much without danger.

As a whole, the design provides for a structure of great merit. The cost for a single track throughout, without the tunnel, is estimated at $1,767,274. For double track approaches on the New York and Long Island sides, and single track across both arms of the river and across Blackwell’s Island, it is $1,932,878. If, however, it is desired to provide for an eventual second track, the cost of first erection will be increased by $151,000, say to $2,083,878, while the addition of the second track (at present prices) would cost $202,400 more; thus making the cost of a double track structure throughout $2,286,278.

IX. The plans presented by Mr. Charles Macdonald for the Delaware Bridge Company propose, for the spans across the East River, a novel modification of the Cantilever type of bridges.

This type has hitherto been planned with only two chords or booms, placed as far apart vertically as proved most economical for the intermediate connecting web. This arrangement is the existing and correct practice for girder or truss bridges, and insures economy of material, by carrying the strains as far from the neutral axis as possible.

In a Cantilever bridge, however, the two Cantilevers, balanced over each pier, form brackets, the shore ends of which are anchored down, and their outer ends sustain a central span, merely resting upon them, and free to expand and contract with changes of temperature.

These brackets, therefore, perform a double function. They sustain their own weight and their proper rolling load to the extremity of their arms, and they also sustain the weight of the central span and its proper rolling load, extending between the ends of the brackets.

The Delaware Bridge Company propose to avail of this division of functions, by sub-dividing the Cantilever vertically