IV.

The machinery devised for raising both span and pier worked so perfectly that no drawback was encountered until the junction of the two halves of the bridge. At this stage of the work, the upper chords being almost entirely in tension and the lower chords in compression, the former were nearer to each other than the latter, and when the last sections were put in place the gaps were as follows:

Upper chord east,	gap of	11/3 inches.
" " west,	"	2 "
Lower chord east,	"	11/4 "
" " west,	"	5 "

The first operation was to close the gap of two inches in the west upper chord, which was readily effected by the use of the screw jacks at the shore ends of the bridge and by moving the piers towards each other. This left a gap of $1\frac{1}{8}$ in. between the ends of the east top chord. At midday, therefore, with the thermometer standing at 70° in the sun, all the horizontal laterals tending to draw these ends together were screwed up taut and the counter-laterals were slackened. The contraction of the lateral rods closed the gap at daybreak on the following morning —temperature 40°. The top-chord connections were now riveted up, leaving the gaps in the lower chords respectively one and two inches. The contraction due to temperature had by 4 o'clock next morning withdrawn the shore ends of the lower chords three-quarters of an inch from the jacks. These were screwed out so as to take up this space, and by midday the chord had expanded until the gap in the east chord was closed and the connection was made. This operation was repeated for the west chord, and in twenty-four hours later the junction was made and the girder completed from shore to shore.

The final operation consisted in cutting the lower chord at the previously selected points in the shore spans so as to hinge the girder. Tenonjoints had been made in the lower chord at these points, in which temporary rivets had been driven. These were now driven out one by one until the connection was severed and the end spans hung free. The mean motion of the severed joint after cutting was only $\frac{5}{16}$ of an inch, and the change in the profile of the bridge was barely perceptible. This proved the accuracy of the method used for determining the proper point for cutting. In this the theory of the elastic line was ignored entirely, and the truss was dealt with panel by panel and member by member, chords, posts and ties— until the point of contraflexure was reached.

No 13. Perspective view of Bridge from North Side. 23d Jan. 1877.