counter-braced iron arch on a large scale, under circumstances which would render its failure, under any possible contingency, unattended with risk.

It has been observed that counter-braces are placed above the arch, resting against it by means of adjusting or set screws. In addition to this, there is a vertical post of oak between each pair of suspension rods, also terminating in a set screw resting on the arch. It will be readily perceived that, by loosening the lower counter-brace screws, and by tightening those on the posts, the bridge will be raised upon the arch, and the latter will then bear the whole weight both of the truss and its load. If the arch should prove unable to sustain this pressure, the truss would sink again to its original position and receive the weight.

The experiment thus far has been entirely successful, and shows that the counter-braced arch, which is the lightest and cheapest system possible, is perfectly reliable for spans of any magnitude; it is, in fact, a satisfactory test both of the principle and of the material.

The manner of adjusting the trusses, and the observations subsequently made, were as follows:—

1. All the lower counter-braces were unscrewed.
2. All the upper counter-braces were tightened, but not screwed hard.
3. The levels were taken from a permanent level mark at the foot of every suspension rod.
4. The set screws upon the posts were tightened by two men, with suitable wrenches, beginning at the middle and proceeding towards the ends; after once going over, the level was again taken, and the bridge found to be raised one-fourth of an inch. The same operation was repeated, and the rise found to be half an inch, which was sufficient to make it certain that the whole weight was upon the arch.
5. The upper counter-braces were examined and found to have become loosened; they were again screwed up; the main-braces were loose;—all of which were necessary consequences of raising the truss upon the arch. The time at which these adjustments were made was about 11 o'clock, in July; the weather warm.