practicability, and provided for it in the estimates by careful calculations of the cost of erection.

In view of the high character and known skill of these gentlemen, therefore, we do not feel authorized to dwell upon this point further.

In consequence of an ambiguity in our specifications, as to whether the formula given for calculating the strains upon compression members applied to sections shorter than 24 radii of gyration, the designers (construing the clause strictly against themselves) have calculated the strains upon the main arches at 8,000 pounds to the square inch of section, and thus provided for a structure materially stronger than would have resulted from the alternative construction of the clause (as adopted by the other designers), which gives as a result in some cases about 11,000 pounds to the square inch, and would have saved some 900,000 pounds of material in the largest span alone in this design.

We are informed by Messrs. Clarke, Reeves & Co. that 1,100,000 lbs. of iron, included in their estimate of weights, is wholly required in the erection of the bridge. This amount of iron should therefore be deducted from the actual weight of the completed structure. The large amount estimated for raising the arches may be taken as an evidence of the regard to safety in designing the means of erection.

Objections might perhaps be taken to the necessity of suspending the floor from the panel points of the arch, but the designers have judiciously planned to lattice together the suspension ties (the longest of which is eighty feet long) in order to give the floor platform lateral stability and counteract the tendency to swing sideways from the effect of the wind.

We may notice the following points which would require attention, were the plan to be selected for erection:

1. The lateral bracing is necessarily omitted out of eight panels in the counter arch and four panels in the main arch, in order to allow for head room in the roadway where its line intersects that of the arches. This would require the strengthening of the joints and columns past these points.

2. The piers being designed mainly to form, with the inclined struts, fixed points for the hinges of the lunettes, and bearing none of the dead load, cannot form supports against strains from the live load, arising from partial loading, without