in the road bridges we have alluded to, and as in the Niagara Bridge (which only permits slow motions of trains), the truss is continuous. Hence the compulsory resort to trusses hinged at the centre. This arrangement, or others hitherto proposed (which we have not room to discuss), involves very considerable departure from the ordinary methods of suspension, and none of the designs submitted (except, perhaps, that of the Cincinnati Bridge Company) seem to recognize this fact.

VII. The design of Messrs. Henry Flad & Co. consist, for the large spans, of straight link suspension, or, more properly speaking, derrick bridges, which are planned for a double track throughout, including the approaches.

A sketch of the main span is shown on plate VII.

The difficulty in preventing the long suspension links from sagging down from a straight line by their own weight and thus destroying the theoretical adjustment of the bridge, is quite ingeniously met by a system of braces and ties, which unite all the links by circular arcs and prevent their becoming catenaries instead of straight lines. This detail we believe to be quite novel and to overcome, in a great degree, the objections which have heretofore been raised concerning derrick bridges.

The calculations of strains and computations of quantities are correct, but there are some deficiencies in the wind bracing between the two principal trusses, which would somewhat increase the quantities of material estimated. The most objectionable feature about the design, however, is the fact that both the roadway and the sidewalks are placed upon projecting brackets outside of the line of the trusses, the brackets being imperfectly connected to the boom, thus giving a narrow base and objectionable arrangement. The plan, nevertheless, is a good one, but not the most economical one. It is estimated to cost $2,610,785 for a double track throughout, the designer not having furnished a plan for a single track bridge susceptible of future enlargement.

The greater cost of Messrs. Flad & Co.'s design is probably due to the fact that, as each set of straight suspension links support a uniform length of 50 feet, they have to provide for the maximum live load which occurs upon such a span, say 4,750 pounds per lineal foot, while the maximum weight which can