

remaining four were respectively examples of the Post, the double and the single triangular, and the Fisk suspension trusses. On the 30th of October the contract was let to the Keystone Bridge Company, of Pittsburg, Pa.; the fixed spans were to be built according to the plans supplied by the chief engineer, the iron in them being paid for by the pound, and the timber by the foot; the draw was to be built, according to the contractors' design, for a fixed sum; subject, however, to such alterations as might be suggested by the chief engineer, the Company to have the benefit of any saving which might result from such changes, and to pay any extra cost which they might involve. Under this provision certain changes were suggested in the depth of the truss and arrangement of panels, which resulted in a material reduction of the cost. By a subsequent arrangement a pony truss of wrought-iron, made by the contractors from their own designs, was built, in place of the composite structure proposed by the engineer for the shore span of 66 feet.

The general design of the fixed spans is that of a double triangular truss or trellis girder, in which the top chord, posts, and braces are of wood, and the other members of wrought-iron, cast-iron being used in the details and connections. This combination, which has been used as yet only to a limited extent, is believed to overcome the most objectionable features of a wooden bridge, avoiding the wasteful connections which accompany the use of wood in tension, and disposing of the bulk of the perishable material in places where it can easily be protected; besides this, the character of the butt-joint connections, used to take compression, is such, that worn out parts can be removed and replaced by others without disturbing the remaining parts of the structure; it is also possible to replace the wooden parts by iron, and thus gradually convert the bridge into an iron structure without the expense of false-works or the intermission of traffic. The braces, which are always open to the air on all sides, are exposed to moisture only during the actual prevalence of a storm, and would therefore be well protected by a thorough coating of paint. The top chord can be covered in, and thereby thoroughly protected from the weather, without perceptibly increasing the wind surface of the bridge. The only danger to which such a bridge can be exposed is that of fire, and if the wood-work be painted throughout with mineral paint, and a watch kept, which is always