19 wire ropes, each 2 1/2 in. diameter, will be noticed descending in straight lines to different points in the floor. Crossing the suspenders diagonally, the two are connected by wire wrappings, which keep them firmly in their position. Thus a network is formed that occupies the same inclined plane, which coincides with that of the cables. The total number of stays in the main span is 76.

The total width of the floor is 86 ft. between the outside railings. The cables are suspended between the roadway and sidewalks, and they form, therefore, together with the suspenders and stays, division lines. Inside of the suspenders two lines of iron trusses, 10 ft. high, extend over the whole length of the bridge from abutment to abutment.

It was resolved to employ wrought iron in place of wood for the framing of the floor, and, accordingly, all the bearing parts are made of iron. In its general features, the iron framework of this bridge is similar to that of the Alleghany Bridge at Pittsburg. Every 5 ft., corresponding to the suspenders, iron beams, 30 ft. long, are attached to the latter. These beams are made of two pieces, spliced in the centre; their section is of the usual beam pattern, 7 in. deep, weighing 20 lb. per foot linear. At the points of suspension, each beam is further strengthened by additional flat bars 7 ft. long, 6 × 3/4 in. section placed on each side of the stem. As no outside cables are employed for the support of the sidewalks, this additional strength became necessary. Under the roadway, each beam is further strengthened by truss rods, which pass under the centre girders.

Underneath the floor beams iron girders 12 in. in depth, weighing 40 lb. per foot linear, and rolled in lengths of 30 ft., are suspended in the centre of the floor, running lengthways. Another line of 9 in. girders, weighing 50 lb. per foot linear, rests on top, and corresponds to the lower line. The upper and lower girders thus embrace the floor beams, and are bolted together in such a manner, that in point of stiffness they are more than equivalent to a continuous plate girder of the same depth. As soon as this composite girder was put in place and the bolts tightened, the stiffness of the floor was sufficiently increased to admit of the passage of heavy loads. Its principal object is to distribute the effects of heavy transitory weights over a greater length of floor, and also to assist in meeting the impressions made by heavy gales.

In order to allow for the contraction and expansion to which an iron girder of 1630 ft. length is exposed, in consequence of the variations of temperature, slip joints are employed in the splices. Riveting was of course out of the question. Although provisions might have been made on the towers to allow the whole girder to expand and contract, its effect upon the planking, as well as upon the whole framework, would have been fatal.

The same principle is observed in the combination of the trusses which separate the roadway from the sidewalks. These are also 1630 ft. long, and their efficiency, of course, depends in a great measure upon their true alignment. As their sole object is to increase the vertical rigidity of the floor, the strength and arrangement of the different parts is, of course, the same throughout. Iron posts, 10 ft. long, 7 in. deep, and of the same section of the floor beams, are set up in a vertical position upon each beam. The upper and lower chords are formed by four lines of trough bars, 9 in. deep in section, with 2 1/4 in. flanges. Tension bars 3 in. wide by 3/4 in. thick, their upper ends welded to screw bolts 1 1/4 in. in diameter, are placed in position diagonally, so that each of them extends to the third post, passing through the centre of the second one by a slot cut out of its stem. Thus the bars form a diagonal network, crossing each other nearly at right angles. The lower ends form eyes, held by pins, which connect the lower chords, the two pins next to a post being again connected by two stirrups, which pass under the beams, and are tightened by wedges. The upper screw bolts are passed through cast iron triangular blocks, which rest on the tops of the posts, and receive the pressure when tightened up. The small additional weight which these trusses have added to the floor is well compensated for by its increased stiffness. The floor of this bridge possesses more inherent stiffness than is ordinarily exhibited in timber railway bridges of large spans.

As an additional means of preserving the alignment of the trusses, strong braces, made of 1 1/4 in. square iron, connect the posts and floor beams.

The roadway for vehicles is divided into two tracks, which compels wagons to keep to the right, and to follow each other in succession. By this arrangement all confusion and turning out is avoided, and more teams can be passed than would otherwise be possible. The tracks are formed by four lines of iron tramways, each 14 in. wide; thus all the different gauges of vehicles are accommodated, street cars included.

The flooring of the roadway is composed of three thicknesses of plank, making a total average thickness of 8 in. Most of this plank is oak. All the lumber was thoroughly seasoned in a drying house, and was planed down to an even thickness, except the track planks, which were left rough. To keep the water out from between the courses, a mixture of coal tar and resin was copiously applied in a hot state to every layer. The lowest course of plank is fastened to the iron beams by small bolts; the upper courses are secured by wood screws. The two lower courses are laid lengthways, the third course on the horse tracks is laid crossways. This