elevation and plan of one span drawn to an enlarged scale. Fig. 5 is a section of one of the piers transversely to the line of the bridge, and Fig. 6 a transverse section through one of the spans. The timber portion of each pier is formed of fifteen timber stanchions braced together by iron ties, as shown in Fig. 5, these stanchions being arranged in three rows, transversely to the line of the bridge, five in each row. In the case of the river piers the bases are formed of granite facings filled in with brickwork; but in the case of those constructed on the dry ground, the granite facing is omitted. The bridge was constructed from the designs of Major George W. Whistler, of the United States Engineers, the engineer of the St. Petersburg and Moscow Railway, and it is altogether of an American type. It carries a double line of rails, its width being 31½ ft.

Two spans of the bridge above described were destroyed by fire towards the close of 1869, but were reconstructed, and the through traffic was restored in the early part of 1870. The perspective view of this bridge, given in Plate XVII, was made from a photograph taken after the restoration of the two spans. The Mata bridge is interesting as illustrating the class of bridges on this railway, which are gradually being superseded by iron structures, and it is one which, sooner or later, will itself be replaced by a bridge of a more permanent character.

It was this liability to destruction, both from fire and decay, which formed an inherent element of danger in these bridges, that led to a determination several years since to replace them all by iron structures. The partial destruction of the Mata bridge probably hastened the conclusions on this point, for shortly after the accident it was decided to reconstruct all the other bridges, and tenders were invited from various European engineering firms for that purpose. Eventually Messrs. Andrew Handyside and Co., of Derby and London, obtained the contract for the supply and erection of seventeen of the bridges, with spans varying from 60 to 90 ft. The designs for these bridges were supplied by the Russian engineers, and they are all more or less copies of each other. On the present and preceding pages we illustrate one of these bridges, for a double span. In the engravings Fig. 1 is an elevation, Fig. 2 a plan, Fig. 3 a vertical transverse section through the girders near the pier, and Fig. 4 a plan of the pier of the bridge, while Fig. 5 is a transverse section or diagram showing the wooden structure, and is illustrative of the method of building the new bridge into the old one. And here we may observe that although the drawings have been copied from Russian originals, the figured dimensions have not had to be altered or translated. This arises from the circumstance that when Peter the Great returned to Russia from England he took with him our foot and inch, which have become standard measures of length in the former country. The total width of the opening is 143 ft., each girder—which is of the ordinary lattice type—being 74 ft. in length, and 9 ft. 2 in. in depth. The girders are riveted together over the centre of the pier, the ends resting on masonry abutments. There are four girders in each bridge, two inner girders being 4 ft. 10½ in. apart, and the outer girders being distant 6 ft. 6 in. from the adjoining inner girders. The two outer girders are thus 17 ft. 10½ in. apart from centre to centre. The girders are braced together in pairs by diagonal bracing, as shown in Figs. 2 and 3, the two pairs being connected by transverse tie bars, as seen from the plan of the bridge. The roadway is carried on the top of the girders upon transverse timbers, on which a longitudinal timber decking is laid, the width between the hand-rails being 24 ft. The piers consist of four built-up wrought-iron columns, square in plan, and which may be compared to box girders placed on end. In plan these columns have a box section 3 ft. long by 1 ft. 6 in. wide inside, the end plates, which are ¾ in. thick, being 2 ft. 5 in. wide, so that they project beyond the sides of the box section, while the sides, instead of consisting of plates, are made up by a bracing of 3 in. by 3 in. by ½ in. angle irons, arranged as shown in Fig. 1, and rivetted to 5 in. by 5 in. angle irons on the end plates. Angle irons 5 in. by 4 in. by ¾ in. are also rivetted to the outsides of what we have called the end