rate of advance made at first was 3ths of an inch per stroke, or 1 ft. in 1½ minute = 40 ft. per hour, but this rate of travel fell off after awhile to 10 in. in 1½ minute, giving an average throughout of 11 in. per 1½ minute. After about 50 ft. of the girders had been thus traversed forwards, operations were stopped, sufficient having been done to demonstrate the thorough practicability of this mode of getting the girders into position upon the piers. There was thus an overhanging length of about 100 ft., the deflection or drop of which was found to be only 10 in., showing that there is ample rigidity in the girders, some of the members of which, however, were temporarily braced to counteract the effects of any adverse strains.

In considering the construction of these girders and this method of dealing with them, it will be seen that the strains to which they will be subject when in position are to a great extent reversed whilst being moved over the piers. For instance, when a girder has been travelled out from the first pier, and until it reaches the next, it will be in the condition of a cantilever. In this state the strains in the diagonals become altered from those of tension into those of compression. To meet this change of strain, angle irons were temporarily bolted on to the inside and outside of some of the diagonals nearest each end of each girder, by which they are enabled to act as struts. The central portions of the girders do not need this provision, inasmuch as they are cross braced. After the girders were placed in position, the angle irons could be removed and returned to the erecting shop ready for use again. In like manner each set of hydraulic apparatus was removed from under the girder as soon as it is in place and returned to the working end of the bridge ready for the next pair of girders. The bridge in effect formed its own staging as the roller bearings were picked up from the tail of the girder as it advanced and left them behind. They were carried forward to the front end of the girder, and when it reached the pier they were placed upon it to receive the advancing structure.

The bridge has been carefully designed, and is well adapted for its purpose, which is to carry the railway and road traffic across the river, from Cawnpore to Lucknow. It will be seen that the girders will rest on brick piers, carried down to a considerable distance below the bed of the river, which is of loose sand. The lower portions of these piers are built up in two cylinders, each 10 ft. in diameter, and which are coupled at a point near the level of the river bed. Thence upwards the piers are 22 ft. in width and 10 ft. in thickness, terminating in stone caps, 24 ft. wide and 12 ft. thick.

There are twenty-four of these piers placed 110 ft. apart, centre to centre, the bridge consisting, as we have said, of twenty-five river spans of 100 ft. each in the clear, and two land spans of 41 ft. each. The girders for twenty-two of the river spans are made up into eleven pairs, connected end to end in the manner we have described, and the last length consists of three girders made up in one piece in the same way. In Plate LXXXI., Fig. 1 shows an elevation of one of the land spans over the approaches to the road; the abutment pier; the first river span; and the first river pier. Fig. 3 represents a plan of the two spans shown in Fig. 1, with the platform of the railway removed. Fig. 2 is a plan of one of the piers. Fig. 5 is a cross section of the bridge at the centre of one span, drawn to an enlarged scale, Fig. 6 being a longitudinal section taken at the same point, and drawn to the same scale. The arrangements for the traffic are thus clearly seen; a single line of railway is carried on the top of the girder, whilst the road traffic passes through it, being conducted to it by approach roads at each end, as seen in the plan at Fig. 3. It will be observed that the width of the roadway is only 9 ft., rather narrow for cart traffic; but then it is to be remembered that the main purpose of the bridge is to carry the railway, the roadway only being a secondary consideration. It will, however, be an easy matter to regulate the traffic, as is done on other bridges of similar construction in India.

The longitudinal and cross sections at Figs. 5 and 6 illustrate the method of laying the longitudinal timber bearers and decking of the cart road, as well as the details of the railway platform. The timbering of this latter portion consists of two main longitudinal bearers 10½ in. x 9 in. resting on brackets riveted to the square frames and notched to receive the top bracing of the girder. To these are bolted transverse bearers 12 in. x 6 in., on which again is spiked 2 in. bracing. The rails are of the Vignoles section 60 lb. to the yard, and are held down on 3 in. longitudinal timbers by dog bolts which pass through the timber cross bearers. The rails are laid to a gauge of 5 ft. 6 in., and the planking between them is covered with corrugated galvanised iron, 18 W. G. for the whole length of the bridge, as a precautionary measure against fire from the engines, and also as a preservative against wet. At the end of each girder a gutter is fixed to carry off the water. The width of the railway platform is 16 ft. between the railing standards, which are of angle iron with ornamental cast-iron tops. They are placed 7 ft. apart, and carry three lines of 1 in. red iron, forming a neat railing which flanks the platform on each side for the whole length of the bridge.

Each of the sides of the structure consists of a single trussed girder, the flanges being composed of horizontal and vertical plates, and the web of vertical struts and diagonal ties. The top flange is composed, at the ends, of a horizontal plate, 18 in. wide by ¾ in. thick, and a vertical plate 18 in. deep by ¾ in. thick, connected to-