

river another short span of about 43 feet, called the 'draw span,' and intended to be used as such should it be required.

The spans at the west end of the bridge over the tow-path and canal were  $76\frac{1}{2}$  and 140 feet in length, respectively, making the whole length of the bridge  $1524\frac{1}{2}$  feet.

#### DIFFICULTY OF CONSTRUCTION.

It was required that the new iron bridge should be erected on the same line as the old wooden structure, without interrupting the traffic of the road. The difficulty of this undertaking will be appreciated, when it is considered that twenty-two regular trains, and from two to four extra trains, pass over the bridge daily, and mostly during working hours. Perhaps no similar undertaking of equal difficulty has been attempted.

In the reconstruction of the Dinting and Mottram Viaducts, on the Sheffield and Manchester railway in England, the old wooden superstructure was replaced by iron girders, and the matter was considered of sufficient importance by the distinguished engineer, Mr. William Fairbairn, who planned the work, to be worthy of a special paper, which was presented before the Institute of Civil Engineers, London, in February, 1863.

On these bridges there was a double track, supported, in the case of the Dinting Viaduct, by four wooden arched ribs, and in the case of the Mottram Viaduct, by three.

The plan adopted was to build one girder, turn the traffic on to the opposite side and lower it to its proper position; then to place temporary floor beams across the top of the middle arch and the new girder, to support that side while the other new girder was built and lowered to its place.

This, it will be observed, did not present the same difficulty that would have been experienced had there been but a single track, as in the Connecticut River Bridge.

The requirement of keeping up the traffic on the road necessitated many modifications of the plan for the bridge; the principle one of which was, placing the girders which were constructed within the old bridge nearer together than would, under ordinary circumstances, be deemed advisable, although they are sufficiently far apart for strength and safety. There are many instances where the girders are considerably nearer together than in this bridge.