than a common bridge, since the steady motion of cars has not that tendency to produce vibration, which arises from the trotting of horses. Still, it is an object to secure stiffness in the cross beams in all cases.

Fig. 36, Pl. 7, shews a good form for a trussed cross bearer for a rail road bridge. All except the two short braces is 8×8 inch stuff. The two short braces 3×3 inch stuff. The long and short bolts, $\frac{3}{4}$ or $\frac{7}{8}$ inch iron, according to the distance of the cross bearers asunder. The truss should be not much less than 3 feet deep in the middle, and the line of the centre of the main braces, should meet that of the bottom timber, at the centre of the main trusses of the bridge. The boxings at the foot of the brace should be about $1\frac{1}{4}$ inches deep, for the extreme one, and about 3 inches for the other. The upper end of the main braces should be made square, and the necessary bevel all made upon the top piece. This truss, if 3 feet deep, is good for about 16 tons.

The 60 feet bridge estimates at 600 cubic feet of timber, and 1,000 lbs. of iron.

An 80 feet Bridge.

LXX. On the preceding plan, a truss of 70 feet in the clear, requires a height of 12 feet from centre to centre of the stringers. For trusses exceeding this height, it is very desirable that they should be connected at the top, as it is somewhat troublesome to support them independently in a vertical position. By adding one or two to the number of pannels, the length may be increased to near a hundred feet with a height of about 12 feet. This would answer a tolerable purpose for common roads, and even for rail roads, they are frequently built of no greater height. But we have seen that there is a loss of economy when the length of the truss exceeds about six times its height.

Rail road bridges require about 15 feet in the clear, above the top ef the rail, which takes about 18 feet