

ders it necessary that each panel should have a plate of different length and thickness from the next, but as the plates are of a very simple form, and only five patterns are required, the expense is trifling in comparison with the advantage of varying the size according to the pressures; the cast plate is 1 inch by 5 inches in the middle of the span, and  $1\frac{1}{2}$  by 5 inches at the ends.

The cross section of the castings, including the projection on the top and bottom, is in the middle	8,214 sq. in.
At the ends	10,714 “
The number of square inches in each rail	4,794 “
The entire cross section of each arch at the middle is	17,802 “
And at the ends	20,302 “

The rise of the arch from under side at skew-back to under side at crown is 8 feet 9 inches.

The upper chords are 3 in number, each  $5 \times 9$ , placed  $1\frac{1}{4}$  inches apart to allow the diagonal rods to pass between. The length should be 36 feet. The lower chords are 2 in number  $6 \times 9$ , placed 5 inches apart, and continuing from pier to pier without joints.

The posts, which extend from the upper to the lower chords, are  $4 \times 6$  inches, and 9 feet 4 inches long from bottom of top chord to top of bottom chord. These posts are in pairs, placed 5 inches apart, to admit of the passage of the arches between them. Between each pair of posts and above the arch is a third post  $5 \times 8$  in. of hard stiff wood, as white-oak, or locust, the office of which is to transmit the pressure of a passing load directly to the arch. The smaller posts serve to connect the system of counter-bracing, give great lateral stiffness to the arch, and, were the failure of the arch under any circumstances possible, they would form the posts of a framed truss sufficient of itself to sustain any ordinary load. There are rods in the direction of both diagonals of the panels, and each set is in pairs.

The rods which extend from the top chords towards the centre, constitute, with the posts just described, a distinct system, which may or may not contribute to any considerable