but in bridge building, will seldom be less than 10 to 14 feet, where timber beams are employed. Hence, for bridges of a length of 12 to 14 feet, usually, nothing better can be employed than a structure supported by longitudinal beams, with their ends resting upon abutments or supports upon the sides of the stream.

Of course, no reference is here had to stone or brick arches. For, though these are advantageously used for short spans, and in deep valleys, where the expense of constructing high abutments for supporting a lighter superstructure, would exceed or approximate to that of constructing the arch, it is the purpose of this work to speak only of those lighter structures, composed mostly of wood and iron, and supported by abutments and piers of stone, or by piles, or frames of wood.

Having then adopted the use of beams for supporting weight upon short spaces, it is only necessary upon longer stretches, to provide support for a point once in 10 or 14 feet, by braces, &c., from the extremities; and for intermediate points, to depend on beams or joists extending from one to another of the principal points provided for as above.*

VI. For a span of 20 or 30 feet, it would seem that no better plan could be devised, than to support a transverse beam midway between abutments, by two pairs of braces or suspension chains, proceeding from points at or over the abutments, one pair upon each side of the road-way; this transverse beam affording support for longitudinal beams or joists extending

*It is susceptible of easy demonstration that the power of beams to sustain weight by lateral stiffness, forms no exception to the principle that oblique forces alone can sustain heavy bodies over inaccessible spaces. But this matter is deferred for the present.