The lower rail should have a depth (if of cast iron), of 4 to 5 inches, according to size of bridge; and the upper and inverted one, of one to two feet (the deeper the stiffer), and in both cases, they will generally be cast in segments, and those of the upper one, bolted together by flanges, so as to form a rigid hoop, over which one or more strong beams, $BB$, crossing at quadrant points $ee$, etc. (or at the angular points of any rectangle inscribed in the circle), should form supports for the king posts ($ag$, and $ch$, Fig. 71), the space $gh$, being adjusted to an equality with the side of the inscribed square or rectangle of the rail circle. And, the nearer the transverse distance between king posts comes to the length of the other sides of the said inscribed square or rectangle, the less stiffness of beams, $BB$, is required; that is, $CC$, F. 73 representing truss chords, and $dd$, the positions of king posts, the nearer the $d$ points come to the $e$ points, the less is the transverse action upon the beams $BB$. Hence it is desirable that the circle of rollers should pass directly under the points $dd$, etc.

CLXXVIII. An intermediate beam may be inserted between $BB$, and over the centre pivot, resting upon the circle $cc$, to support floor joists or rail stringers over the long stretch between $BB$. Or very stiff diagonal girders $ee$, and $ee'$, firmly attached by the ends to the circle $cc$, meeting a common nucleus at $H$, and so arranged as to have an adjustable bearing upon the centre pivot (5 or 6 inches in diameter, as to size of draw), enabling any desired amount of the weight of structure which such girders can support, to be thrown upon said pivot, and thereby relieving the rollers, $a$, of a like amount of pressure. These girders should have the greatest practicable depth, so as to sus-