

the upright timbers forming the intermediate piers, and the materials and character of the workmanship the same as the abutments of the Saint John River Bridge.

Land Abutment of Truss Bridge.—The foundation of this abutment will be on the solid rock, the height of face about 10 feet, and its dimensions on top will be 23 feet by 20 feet. The character of the masonry is to be the same as the main River Bridge, it is to be fitted to the rock in the same manner, and be carried up with batter, plinth, quoins, and cornice, the same as the westward abutment.

MAIN BRIDGE OVER SAINT JOHN RIVER.

Iron Work.—The two main chains consist each of 4 parallel bars of best hammered iron, the links varying in length from 21 feet to 22 feet 6 inches. Each bar will be 4 inches by 5-8ths of an inch, excepting 2 bars in the three centre panels, which are 4 inches by $\frac{1}{2}$ inch, the least section of each chain in the centre being 9 square inches, and at the ends 10 inches. These chains are anchored in the rock behind the western abutment, pass over the cast iron saddles forming the Bridge seat, cross the River in a catenary curve with a versed sine of 15 feet, pass over the cast iron saddles on the top of the eastern abutment, and are finally anchored at the lower part of the back of the abutment, being so secured as to involve lifting the whole of the block of masonry before yielding to the strain. The bars composing the chain are forged with a round eye at each end, and at the joint the bars in one length each pass between two bars in the other length: a turned iron bolt 2 $\frac{1}{2}$ inches diameter, accurately fitting the hole bored through all the eyes, and coupling the whole together, so as to distribute the strain equally amongst the bars composing each link. At each coupling a cast iron socket is fitted between the chains and rests upon the main bolt which is made long enough to receive it. A cross bolt passes between each pair of opposite sockets, and regulates the distance of the chains apart as well as forming a tie to resist the thrust of the diagonal braces that keep the posts and caps in their respective positions. Resting on each socket is a vertical post of pine timber 8 by 8 inches in the middle panels, and 7 by 7 inches in the end pannels, on the top of which a hacmatac cap, 7 by 13 inches, is framed, and supports the truss Bridge. Diagonal braces framed into the cap, abutting against the opposite socket, and locking together at the intersection, keep the posts in vertical position laterally, and brace the caps and posts firmly together sideways. The length of each set of bars varies to allow for the different angles in which they lie with respect to the Bridge, so as to keep the posts and caps at an uniform distance at the top, and at an equal angle with the curved truss. As an additional security to prevent the Bridge settling under an unequal load, the three centre panels are further connected by two diagonal bars 4 by $\frac{1}{2}$ inch, on each side of the Bridge, from the bottom chord of the main truss, 31 feet 6 inches from the centre of the Bridge, to the socket at the foot of the post, the same distance from the centre on the other side, and crossing each other in the middle at each side of the Bridge.

Wood Work.—The side trusses, which also form the protection on each side of the Bridge, are about 200 feet long, 7 feet deep, and built with a camber in the middle of 5 feet. They are each formed of a top chord 16 by 8 inches, and a bottom chord 18 by 10 inches, kept apart by diagonal braces 5 by 8 inches, and bolted together by two iron bolts 1 $\frac{1}{2}$ inch diameter, at every 5 feet. These bolts pass through the bottom chord, and carry under each pannel a swing girt 6 by 10 inches, except over the upright post, where they screw up on the underside of the cap before mentioned, which forms the swing girt for that panel. There are four of these small panels in the truss to each of the panels formed by the upright posts resting on the chains, so that there are three intermediate swing girts between each of the main posts and caps. From the underside of the chord, close to the swing girt on each side of the cap, a diagonal strut is framed on to the upright post to strengthen it and keep it from springing or changing its position; and similar braces frame on the underside of the cap inside and outside of the post, to strengthen it in the opposite directions, and add to the lateral stability of the Bridge; and on the top of the cap which is lengthened out for this purpose, another diagonal brace is framed to the top chord of the truss, to preserve its perpendicularity, so that every part of the truss is framed and braced to the uprights carried by the main chains. Any tendency to lateral movement is counteracted by a series of diagonal lateral braces from the end of one cap to the opposite end of the