# THE CANADIAN FARMER

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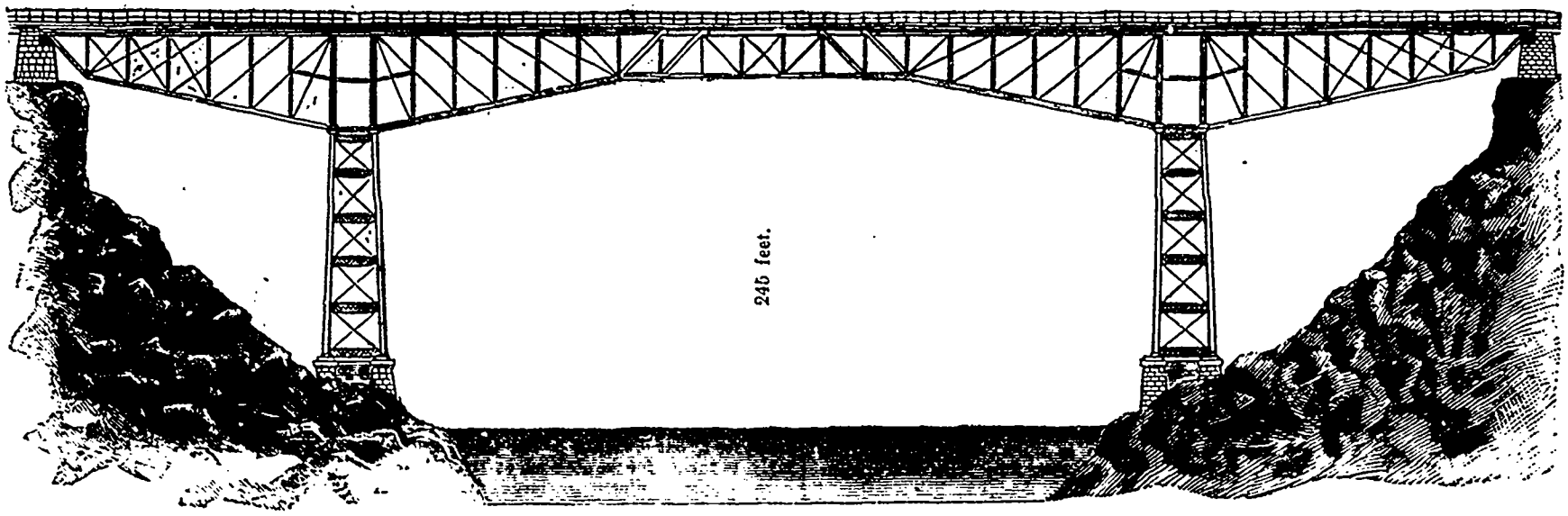
### THE GREAT BRIDGE OVER THE NIAGARA.

The new bridge now in course of construction over the Niagara River at Niagara, is drawing even more attention to itself than has any bridge for a long time past, not excepting even the Brooklyn Bridge. The new bridge attracts attention mainly on account of the novelty of its construction. There is nothing new in the construction of the Brooklyn bridge; it is the same old system, but on a gigantic scale. The heavy expense in building up these suspension bridges was so great that they could not fail to attract the attention of architects to a more economical method of building bridges over a torrent where false work of any nature was an utter impossibility. The bridge over the river Tay as it empties into the Frith of Forth in Scotland, was the first to be constructed on this principle. It will be remembered by some of our readers that on a very stormy night in 1880, as a train was passing over this bridge the structure gave way precipitating the train and passengers into the torrent below. The bridge is now being rebuilt, and on a better principle than the former. Another bridge in course of construction is over the Frazer River on the Canada Pacific Railway. The construction of these three bridges inaugurates a new era in bridge building, the result of which will be closely watched by eminent engineers. The design selected is what is known as the canti-lever bridge, the principle of which is that of a trussed beam, supported at, or near its centre, with the arms extending on each side, and one end anchored or counter weighted to provide for an equal loading. The Tay bridge already mentioned has a clear span of 1600 feet, and that on the Frazer river 315 feet; the bridge illustrated above has a span of 500 feet. The location is at a point about 300 feet above the present suspension bridge, where the chasm is 859 feet from bluff to bluff, and the grade 245 feet from bluff.




THE GREAT CANADA SOUTHERN BRIDGE.

The bridge is being built by the Central Bridge Company of Buffalo, under a contract which requires that it be completed by December 1, next, under a forfeiture of $1,500 per day for each day's delay after that date. The bridge is to be double track and of steel, so as to carry on each track at the same time a freight train of the heaviest kind, extending the entire length of the bridge, headed by two "consolidation" engines, and a side pressure of thirty pounds to the square foot, and under this load the structure is strained to only one-fifth of its ultimate strength. The total length of the bridge is 895 feet, supported on steel towers rising from the water's edge. The clear span across the river is 500 feet, and is the longest double truss ever yet built. No expense will be spared on the structure, and the foundations are being pushed night and day by over 100 men. It is expected to be ready for the masonry by the first of July. The excavations are carried down till the water level is reached, and the space between the huge rocks filled in with cement to form a solid foundation. The blocks of "Beeton Coignet," twenty feet wide, forty-five long and ten feet thick, will be put in. Upon these blocks, of which four will be used, will be built masonry of the most substantial kind, carried up 50 feet above the surface of the water, and on these the steel towers will rest, rising 130 feet above the masonry, and these will support the steel superstructure. Every ingot of steel is subjected to both mechanical and chemical tests, and by this powerful machinery the steel, having a strength of 80,000 pounds per square inch, is cut, bored, punched and planed with the greatest ease. The shore end of the cantilevers will be firmly anchored to the masonry, to constitute the counter-weight to balance the unequal loading on the river arm.

The design of the cantilever is such that, after the shore arm is completed and anchored, as described above, the river arm may then be built out, one panel or section at a time, by means of great traveling derricks, and be self-sustaining as it progresses. After one panel of 25 feet is built and has its bracing adjusted, 10 traveling derricks are moved forward and another panel erected. Thus the work progresses, section by section, until the ends of the cantilever are reached, when there still remains a gap of 125 feet to close. Into this will be swung and suspended from the canti-lever arms an ordinary truss bridge, forming the connecting link and completing the structure. Compensation for expansion and contraction is provided for by an ingenious arrangement between the ends of the canti-lever and fixed span, allowing the ends to move freely as the temperature changes, but at the same time preserving perfect rigidity against the side pressure from the wind. There will be no guys for this purpose, as in the suspension bridge, but the structure will be complete within itself. Neither will there be any of that wave motion noticed on a suspension bridge as a train moves over it.

The *corps* of engineers in charge of the construction of the bridge held a consultation on Saturday morning, and paid a visit to the foundation on which the main pier on the Canadian side has to be erected. The *corps* consists of C. C. Snyder, Esq., of New York, engineer-in-chief; A. R. Trew, Esq., engineer-in-charge; Mr. T. A. Bell, assistant engineer on the Canadian side, and Mr. B. F. Betts, assistant engineer on the American side. These gentlemen, together with their