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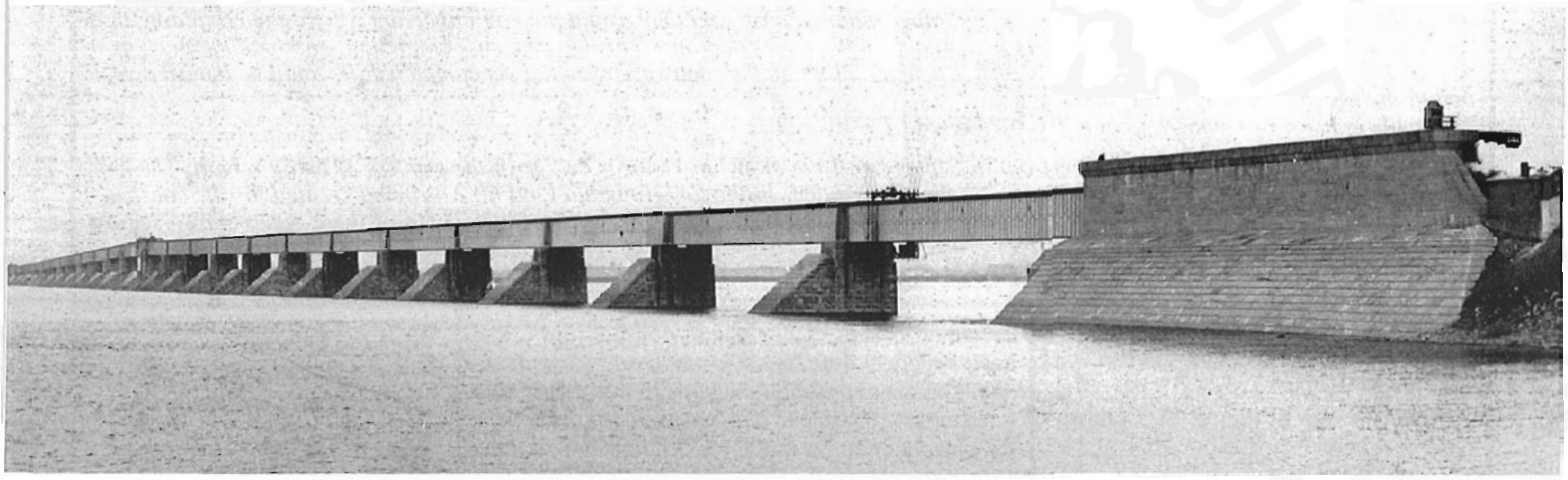

1897

1899

100TH ANNIVERSARY OF REBUILDING VICTORIA BRIDGE

PUBLISHED BI-MONTHLY BY THE CANADIAN RAILROAD HISTORICAL ASSOCIATION

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FRONT COVER: These two photos show the Victoria Bridge before and after the rebuilding which took place between 1897 and 1899. The upper view was taken in the spring of 1897, just before the work began. At that time the bridge appeared little changed from December 1859 when it had been opened to traffic as one of the wonders of the world. Note the "travellers" running on the top of the tube. These were used for painting and other maintenance, and they would play an important role in the rebuilding that was about to begin. The lower photo, taken in January 1899, shows the "new" bridge nearing completion, and looking much as it does today. It was already open as a double-track bridge, although the roadways were not yet completed. It would be almost a year before the last finishing touches were done.
National Archives of Canada, photos PA-202496 and PA-202522.

BELOW: A view of the Montreal waterfront in September 1898 showing Victoria Bridge in the process of being rebuilt. The new steelwork was completed and the old tube was being dismantled. In the foreground, a land fill was being created for the construction of grain elevators. This is one of a large series of views of Montreal, all taken in 1898. Three of these views show Victoria Bridge.
Art Work on Montreal by William H. Carre, 1898.

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EDITOR: Fred F. Angus
CO-EDITOR: Douglas N.W. Smith
ASSOCIATE EDITOR (Motive Power): Hugues W. Bonin
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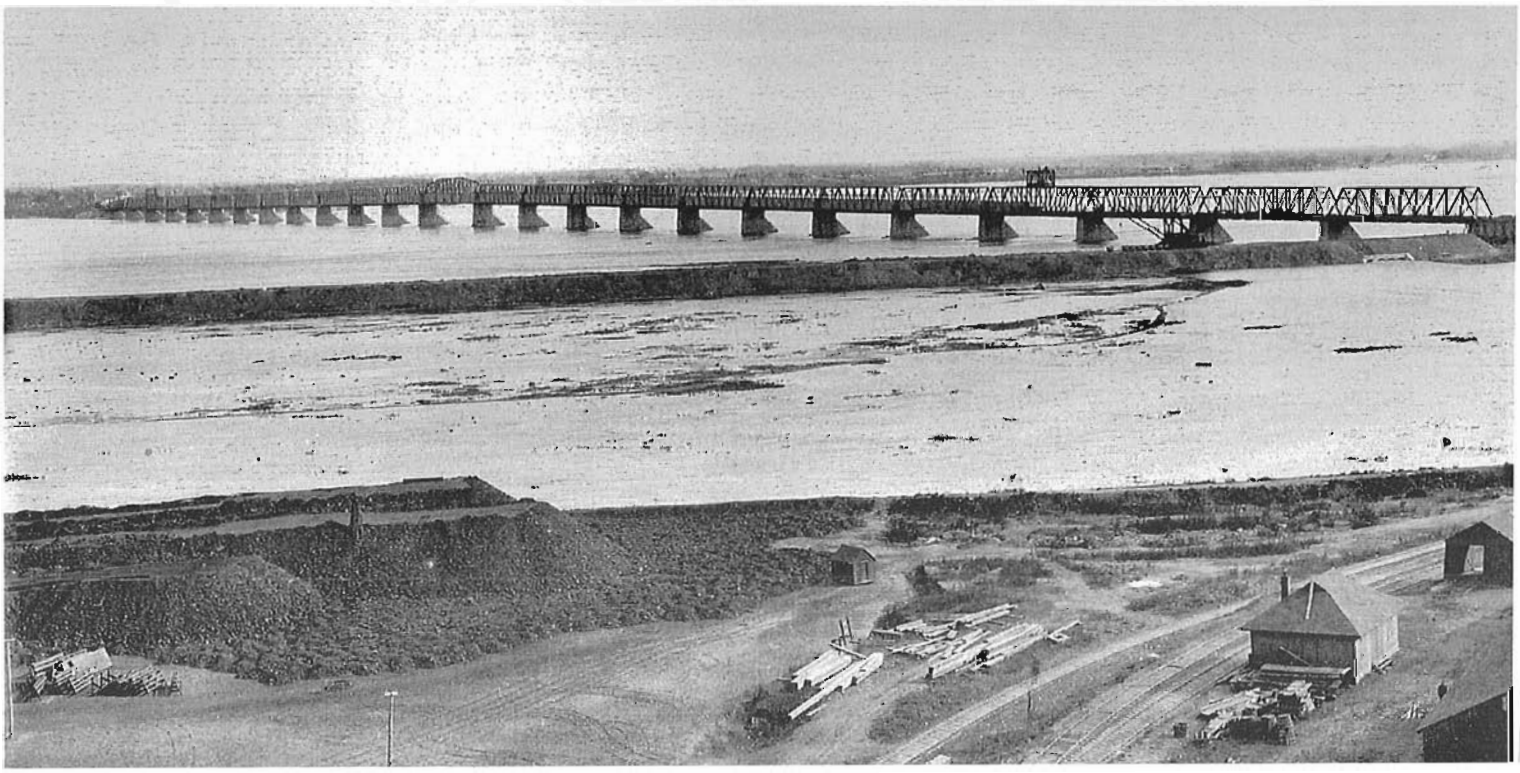


The Rebuilding of Victoria Bridge 1897 - 1899

The official medal, illustrated here actual size, which was made in 1897 to commemorate the Diamond Jubilee of Queen Victoria. One side has a picture of Her Majesty in 1897, while the other shows her as she was at the start of her reign in 1837. The rebuilt bridge was named the Victoria Jubilee Bridge in honour of this occasion.

One hundred years ago, work was completed on a great engineering project; the rebuilding of the Grand Trunk Railway's famous Victoria Bridge at Montreal, so that it could handle the greatly increased rail traffic, as well as communication by road. The project had been in progress for more than two years, and had been planned well before that. By the end of 1899 the rebuilt bridge was complete and ready for the twentieth century.

In 1897 the Victorian era, and the old century, were nearing their respective ends. Few people in Canada could remember there ever having been another queen than Victoria, who ruled an empire on which it was said "the sun never sets". On June 20 of that year, Her Majesty completed sixty years as queen, and celebrations were held in all parts of the British Empire. Canada was no exception, and throughout the Dominion the Queen's Diamond Jubilee was celebrated with great enthusiasm.

The Jubilee was also a good time to look back at all the achievements of the Victorian era. There had been unprecedented progress in so many fields, especially transportation and communication. At the start of the reign railways were in their very early stages; Canada's first one was less than a year old, but by 1897 railways stretched from sea to sea and through most cities and towns. One of the greatest feats of engineering in the first quarter century of Canadian railways was named for the queen. This was, of course, the Victoria Bridge which spanned the St. Lawrence river at Montreal, and was a vital link in Canada's transportation network. In Canadian Rail Number 443, November-December 1994, the building of Victoria Bridge was covered in detail, and it was said that the story would be continued in a later issue. This is that continuation.

On December 17, 1859, the Victoria Bridge was completed after more than five years of work. The following August 25 it was officially opened by H.R.H. Edward Prince of Wales, then eighteen years old, who would one day (January 22, 1901) succeed to the British throne as Edward VII. In 1859 the bridge was considered the "Eighth Wonder of the World", and a true marvel of engineering. But, by the time of the Jubilee, 1859 was a long time in the past, and railways had developed to an extent undreamed of. Victoria Bridge was old-fashioned; in fact some say that its tubular construction was obsolete even before it was completed! By 1897 it had many disadvantages. It was only single-track, its load-bearing capacity was limited, and its tubes were too small to permit large locomotives and cars to pass through. It was strictly a railway bridge, with no provision for road vehicles or pedestrians, and the interior of the structure was hot and smoke-filled like a mile-long tunnel. Even more seriously, the sulphurous fumes from the locomotives, not to mention the salt from the refrigerator cars, had badly corroded the ironwork to the point it could be expected that, within a decade or two, serious structural weakness would result. To put it simply, Victoria Bridge had gone from being the "Eighth Wonder of the World" to a bottleneck on the rapidly expanding Grand Trunk System.

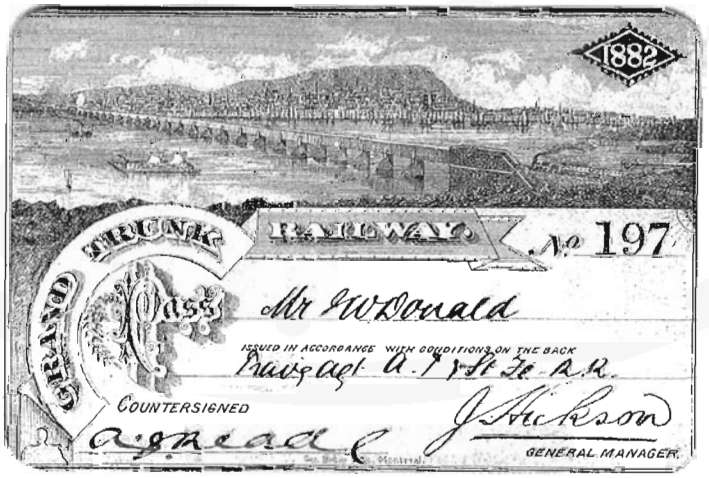
By 1896, the GTR, under its new General Manager Charles M. Hays, had embarked on a massive upgrading and modernization program. Among the goals were the double-tracking of the Montreal-Toronto main line, and the upgrading and rebuilding of major bridges, including the Niagara Suspension Bridge, and Victoria Bridge. Work on the rebuilding of Victoria Bridge began, as we have seen, in the spring of 1897, and was completed in December 1899. It was decided that the rebuilt bridge would have a new name, which still commemorated the Queen. Instead of being simply the Victoria Bridge, it would now be the Victoria Jubilee Bridge, in honour of the Jubilee year in which the reconstruction was begun. This name has continued until the present, although most people still refer to it as "Victoria Bridge".

Although the old tubular superstructure was torn down, much of the old bridge remained, and remains today. The great majority of the work done between 1854 and 1859 was for the 24 piers and two abutments. These were perfectly serviceable, and required only the addition of masonry work above the water level to be able to carry the extra width of the new superstructure. This is clearly demonstrated when we consider the cost. The old bridge cost a total of $7,000,000 in the 1850s, whereas the total expenses to rebuild it in the 1890s was $2,000,000 - less than a third of the original cost. Thus the majority of the investment in building the original bridge was saved.

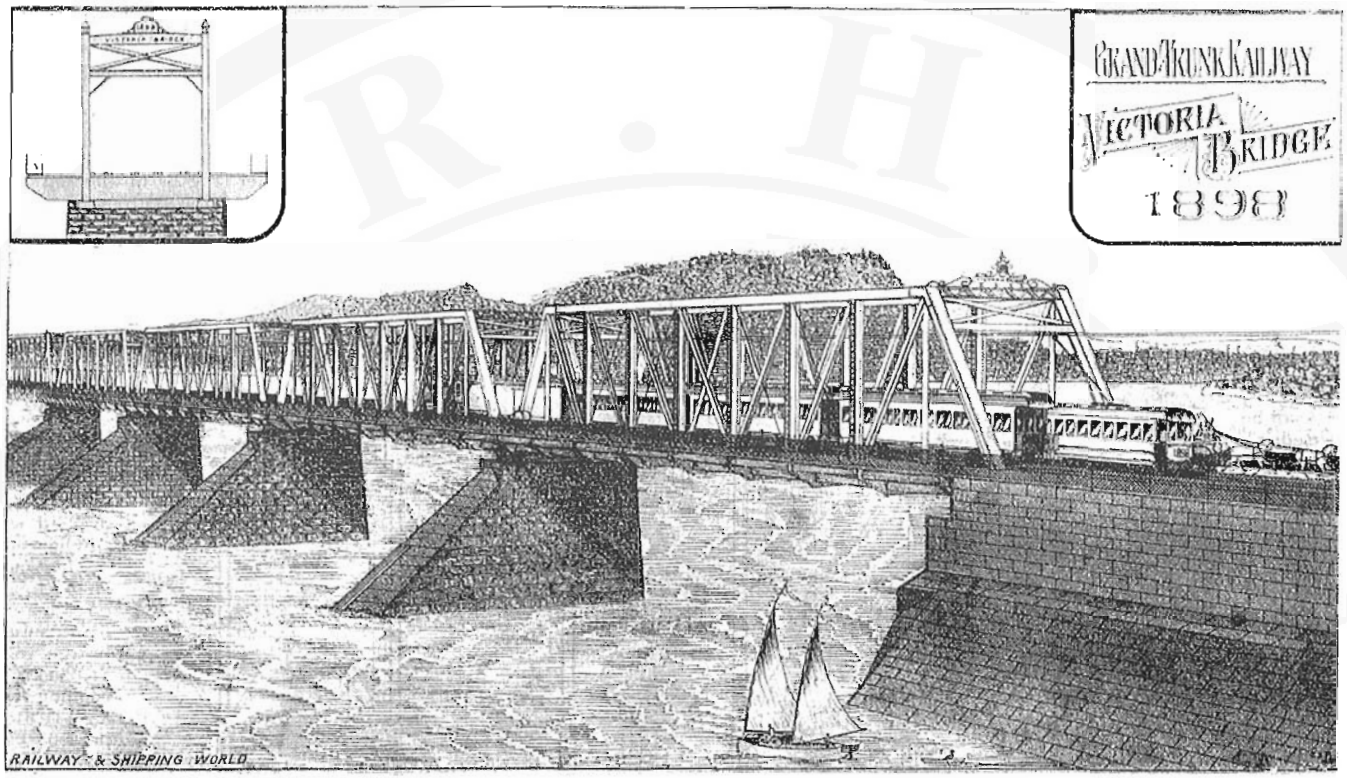
During the reconstruction, many photographs were taken of the work, and an album of sixty-two large clear prints was prepared for a GTR official. This album is now in the Merrilees Collection of the National Archives of Canada, and is an invaluable record. More than half of the photos in that album are included in this article, together with other prints and drawings from other sources.

The magazine "Railway and Shipping World", in its very first issue (March 1898) had a lengthy article, with several engineering drawings, about the bridge, and a later one (October 1900) brought the story up to its completion. Since some material in the 1900 article repeats that in the 1898 one, the two articles are combined here to avoid redundancy. Where there is confusion, the date is shown in brackets. In most cases the original wording is used, although occasionaly edited for clarity. Between these articles and photos, the story of the reconstruction of Victoria Bridge becomes clear. We hope you enjoy it.

Montreal from the lookout on Mount Royal during the rebuilding of Victoria Bridge. The progress of the work dates this photo to mid June, 1898. In the middle foreground is the Prince of Wales Terrace, named for the prince who officially innaugurated the original bridge. This historic terrace was torn down in 1971 *Art Work on Montreal by William H. Carre, 1898.*



A Grand Trunk pass for 1882 showing the original Victoria Bridge



An artist's conception of the Victoria Jubilee Bridge as designed. Note that it was planned to run electric street cars on the main railway tracks. Eventually the cars of the Montreal & Southern Counties Railway did use the bridge, but not until 1909, and then on the downstream roadway, quite apart from the steam railway tracks.
Railway and Shipping World, March 1898.

VICTORIA JUBILEE BRIDGE.

The Grand Trunk's New Structure at Montreal.

From The Railway and Shipping World, March 1898 and October 1900.

THE OLD BRIDGE

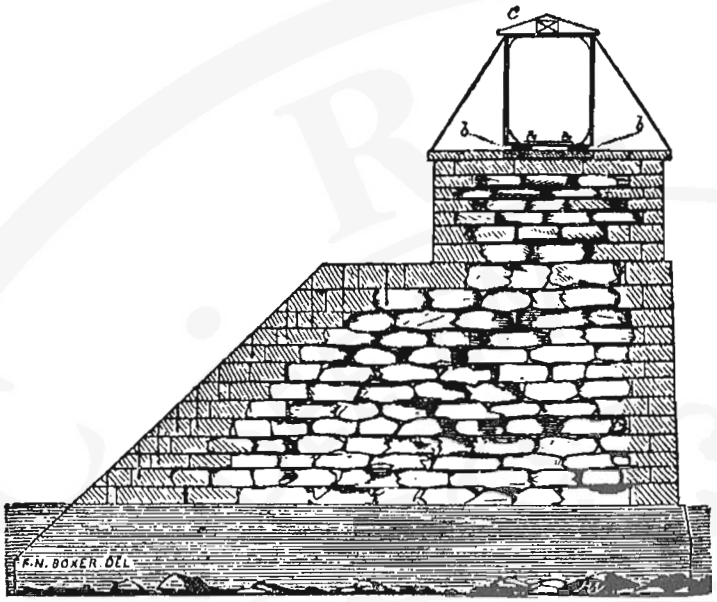
Back in the fifties, Montreal could not boast of a better connection with the railway to the south than by the primitive mode of a ferry across the St. Lawrence River. The terminus of the G.T.R., then called the St. Lawrence & Atlantic R.R., running from Portland Maine, was Longueuil, at which place the Company's steamers were in readiness to ferry the passengers to Montreal, the most important city of all the British possessions in America, and one which at that time warranted the expectation of its becoming an immense metropolis. The population of Montreal was between 60,000 and 70,000, more than half of whom were of French extraction.

Freight was transported in barges and during the winter sleighs were resorted to as conveyances for passengers and merchandise. Twice a year there was a stoppage of traffic from one to three weeks during the fall and spring, when the mighty St. Lawrence was impassable. On one occasion a number of passengers were being carried across the ice bridge in a sleigh, driven by one of the G.T.R. teamsters, when a casualty occurred which proved fatal to one of the number, the others narrowly escaping. When nearing the middle of the stream the whole field of ice, many miles in extent, began to move, but fortunately stopped after going a short distance, and all escaped in safety, except one man who died from exhaustion and fright.

Thus, it may be imagined by those living in the present period that great difficulties and danger were experienced by travellers to and from Montreal in the old days, before the G.T.R. erected that wonder of engineering skill, the Victoria Tubular Bridge, which stood the test of a heavy traffic for nearly 40 years.

It is probable there never was an undertaking so beset with difficulties as the building of the Victoria Tubular Bridge at Montreal. The contractors had to contend not only with a rapid stream two miles wide but with shoves of ice from 3 to 7 ft. in thickness, and from 15 to 20 square miles in extent.

It has been popularly supposed that Robert Stephenson, the famous English engineer, designed the Victoria bridge, but the late Myles Pennington, in his "Railways and Other Ways," says that while Stephenson was the consulting engineer, to Alex. M. Ross must be given the credit of being the suggester, planner and designer of this structure. Mr. Ross had been connected with many railways and public works in Great Britain before he visited Canada. He came here on behalf of English capitalists in 1852. John Young, Commissioner of Public Works for Quebec, pointed out to Mr. Ross the importance or bridging the St. Lawrence. Mr. Ross, after inspecting the locality, suggested the construction of an iron tubular bridge, and returned to England in the fall, carrying with him soundings and plans of the bridge as designed and located by him. In August, 1853, a complimentary dinner was given to Robert Stephenson at



A cross section through pier and tube of the original Victoria Bridge. Hunter's Hand Book of Victoria Bridge, 1860.

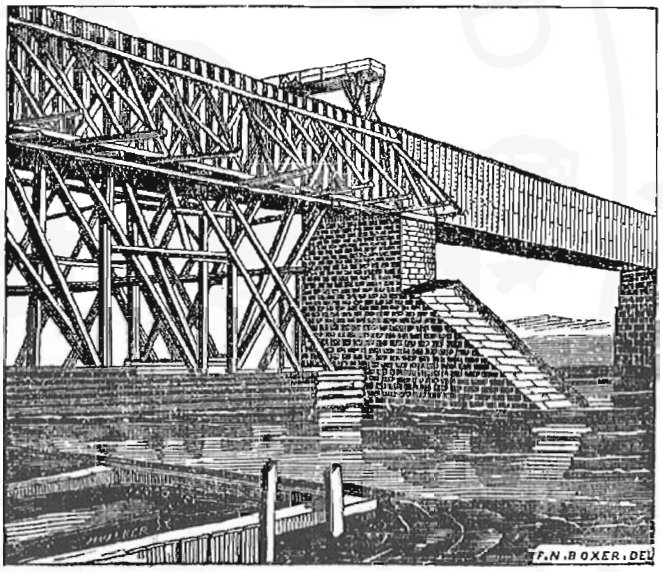
Montreal, when he acknowledged that an abundance of information had been brought to him in England by his esteemed friend Ross, and that he was able to get a good idea of what the bridge was to be before he came to Canada. He added that it was one of the proudest days of his life when he was called to confer with the engineers of the G.T.R. on bridging the St. Lawrence.

The construction of the bridge was an undertaking of great engineering and practical difficulties, but money, perseverance and skill overcame them all. Mr. Pennington gives some idea of the discouragements which were met with. The contractors had to contend with a roaring rapid 2 miles wide, shoves of ice from 3 to 7 ft. in thickness and from 15 to 20 square miles in extent, coming along slowly but surely, with a pressure of millions of tons. Before building a cofferdam wherein to erect a stone pier it was necessary to put down above the site mooring cribs to hold barges and steamboats in position while the building of the cofferdam was in progress.

One winter a large staff was employed cutting holes in the ice and putting down wooden cribs which were weighted with heavy blocks of stone. This was done to save time in spring, but when the ice shove came it cleared away all the cribs and carried the stone into the very spot where the cofferdam was to be erected. Thus the whole winter's work, instead of being of any advantage, was attended with very much loss, both in time and money, for in the spring new cribs had to be put down, and the stones strewn over the bottom of the river had to be fished up one by one before the building of the cofferdam could be commenced.

The tubular form of bridge, then already in use for the railway bridge over the Menai Straits in Wales, was adopted. The tubes were constructed of boiler iron and were 16 X 20 ft. in sectional area, with a simple plate floor and roof, instead of the cellular construction adopted in the Menai Bridge. The bridge is 9,144 ft. long, the total length of the ironwork being 6,592 ft. There are 24 piers and 2 abutments, containing 100,000 cu. yds. of masonry, the thickness of the piers at the water line being 18 ft., except for the 2 piers of the channel span. which are 28 ft. wide. There are 25 spans, 24 of these ranging from 242 to 247 ft. in length, and the centre or channel one having a length of 330 ft. The height from the water to the bottom of this tube is 60 ft., and the bridge has a grade of 1 in 130 from each end to this span. The total weight of iron in the tubes is 9,044 tons. and the area for painting in each coat was 32 acres. The greatest depth of water is 22 ft., and the average rate of the current is 7 miles an hour. The contractors for the bridge were Peto, Brasey and Betts.

The stone for the first pier was laid July 22, 1854 by Sir Cusack Roney. On November 24, 1859, Vice-President Blackwell of the G. T. R.; Attorney-General Cartier, of Quebec; Jas. Hodges, Superintendent of the bridge construction; A. M. Ross, Engineer; W. Shanley, Major Campbell, Messrs. Gzowski, Macpherson, Forsyth, Captain Rhodes and others were the first to cross the St. Lawrence by the new bridge. Mr. Blackwell was on his way to England to attend the Grand Trunk meeting, and was able to report himself as coming via Victoria Bridge.



Erecting the tubes of Victoria Bridge in 1859. Hunter's Hand Book of Victoria Bridge, 1860.

On August 25, 1860, the bridge was officially inaugurated, and the last rivet driven by H.R.H. the young Prince of Wales, on which occasion a grand banquet was held near the bridge, and addresses were given by the Prince, the Duke of Newcastle, Mr. Blackwell, A. M. Ross, C.E., Mr. Hodges and others.

To commemorate this historic event, Mr. Blackwell had a medal prepared by J. S. Wyon, Chief Engraver of Her Majesty's seals, a gold one of which was presented to the Prince, and a bronze one to each of the officers of the G.T.R. It bears a fine impression in relief of the Prince as he then appeared, with the Prince's feathers on the reverse side, and the words, "Welcome, Albert Edward, Prince of Wales, visited Canada and Inaugurated the Victoria Bridge, 1860". The bridge cost $7,000,000, which sum has been largely augmented by the cost of alterations and repairs.

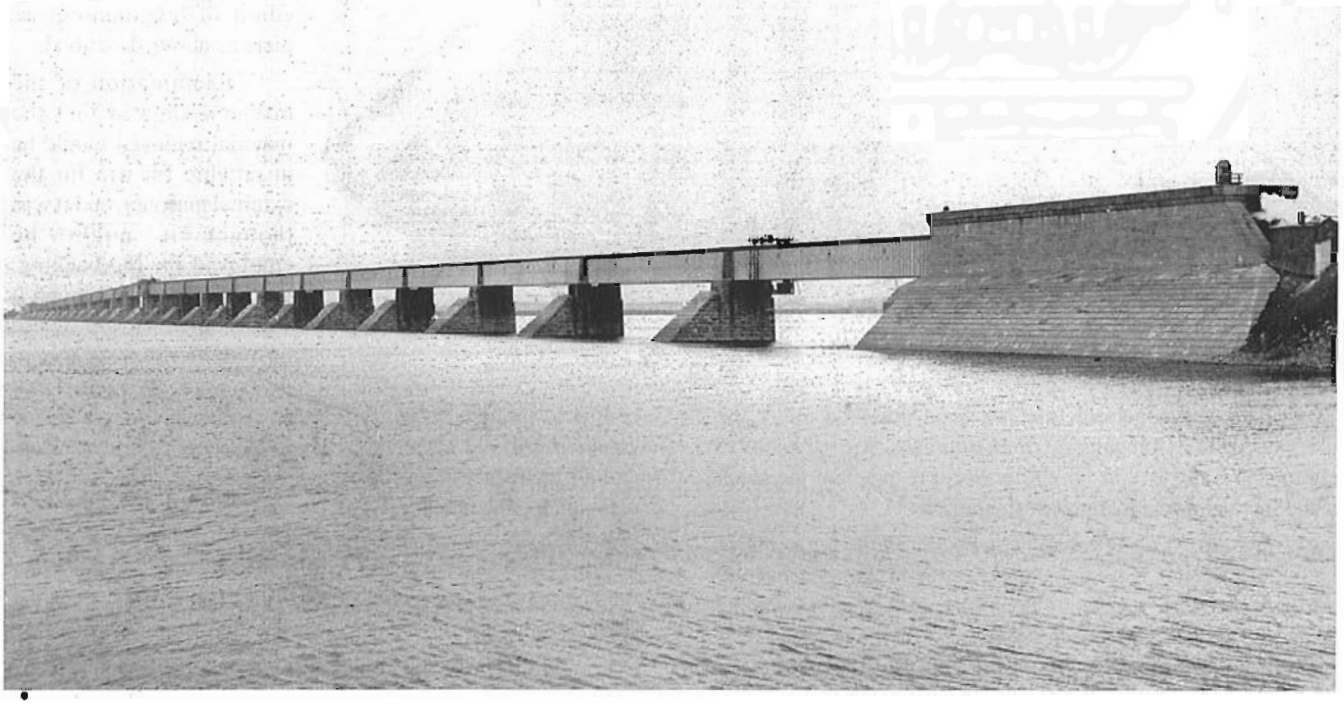
Putting the "Irish Stone" in place, 1859.

The traveller on leaving the Montreal side of the bridge going east may have observed on his left a gigantic boulder placed upon cut stonemason work, surrounded by a picket fence. This boulder was dug up in the vicinity of the bridge while the latter was under construction, and was placed where it now stands by the workmen employed on the construction, in commemoration of the immigrants who died from ship fever during the years 1847-8. The boulder bears the following inscription:

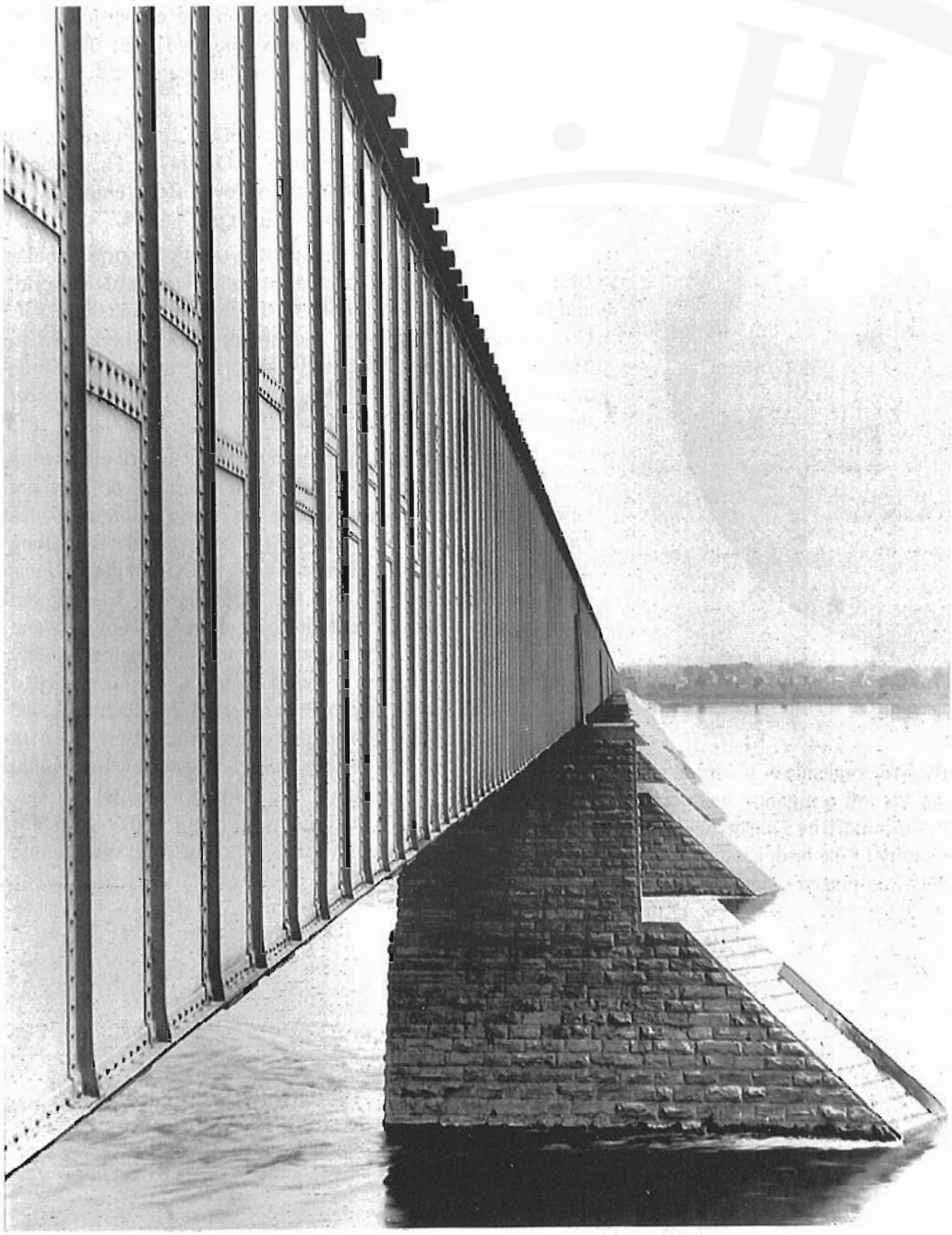
"To preserve from desecration the remains of 6,000 immigrants, who died of ship fever, A.D. 1847-8. This stone is erected by the workmen of Peto, Brassey & Betts, employed in the construction of the Victoria Bridge, A.D. 1859."

At the time of the completion of the Victoria Tubular Bridge in 1860 it was considered the eighth wonder of the world, and was the admiration of not only the promoters and the G.T.R. Co., but of all Canadians and others who looked upon it. Through increase in traffic, and with the onward march of time and improvement, the old bridge had become inefficient to meet the demands of the G.T.R. System.

The smoke, and gases from the locomotives in this long iron tunnel made the atmosphere very foul, and within recent years a strip of the plating along the centre of the roof was removed, the roof being reinforced by riveting angle irons along each side of the opening. Rust and corrosion (from the products of combustion, damp, and the drippings of brine from refrigerator cars) have made inroads upon the ironwork, and while these did not reach such an extent as to impair the safety of the structure, yet they, in conjunction with the incapacity of the single track bridge to provide properly for all the traffic, led the Company management to conclude that the old superstructure must be replaced with a structure which would meet all needs. Accordingly a new open work steel bridge, with double tracks, carriage ways, and foot walks for pedestrains, now rests on the piers which held the old Victoria Bridge for so many years.



The first photograph in the album is this one of the old bridge, taken from the St. Lambert side of the river, in the spring of 1897. Within a few weeks this scene would be very different. National Archives of Canada, photo No. PA-202496.



Looking along the centre span of the old bridge from pier 13. Spring of 1897. National Archives of Canada, photo No. PA-202497.

The new superstructure has been designed under the direction of the Company's Chief Engineer, Jos. Hobson, to whom The Railway and Shipping World is indebted for much of the information contained in this article.

On May 4 , 1897 work was begun on the replacing of the famous tubular Victoria bridge over the St. Lawrence River at Montreal, by truss spans, to be known as the Victoria jubilee Bridge. Work has proceeded so satisfactorily [by March, 1898] that the masonry of the abutments and 18 piers has been completed. One span of the superstructure at the west end of the bridge is in place and the larger part of the material for the remaining spans is manufactured and ready for erection.

THE NEW BRIDGE

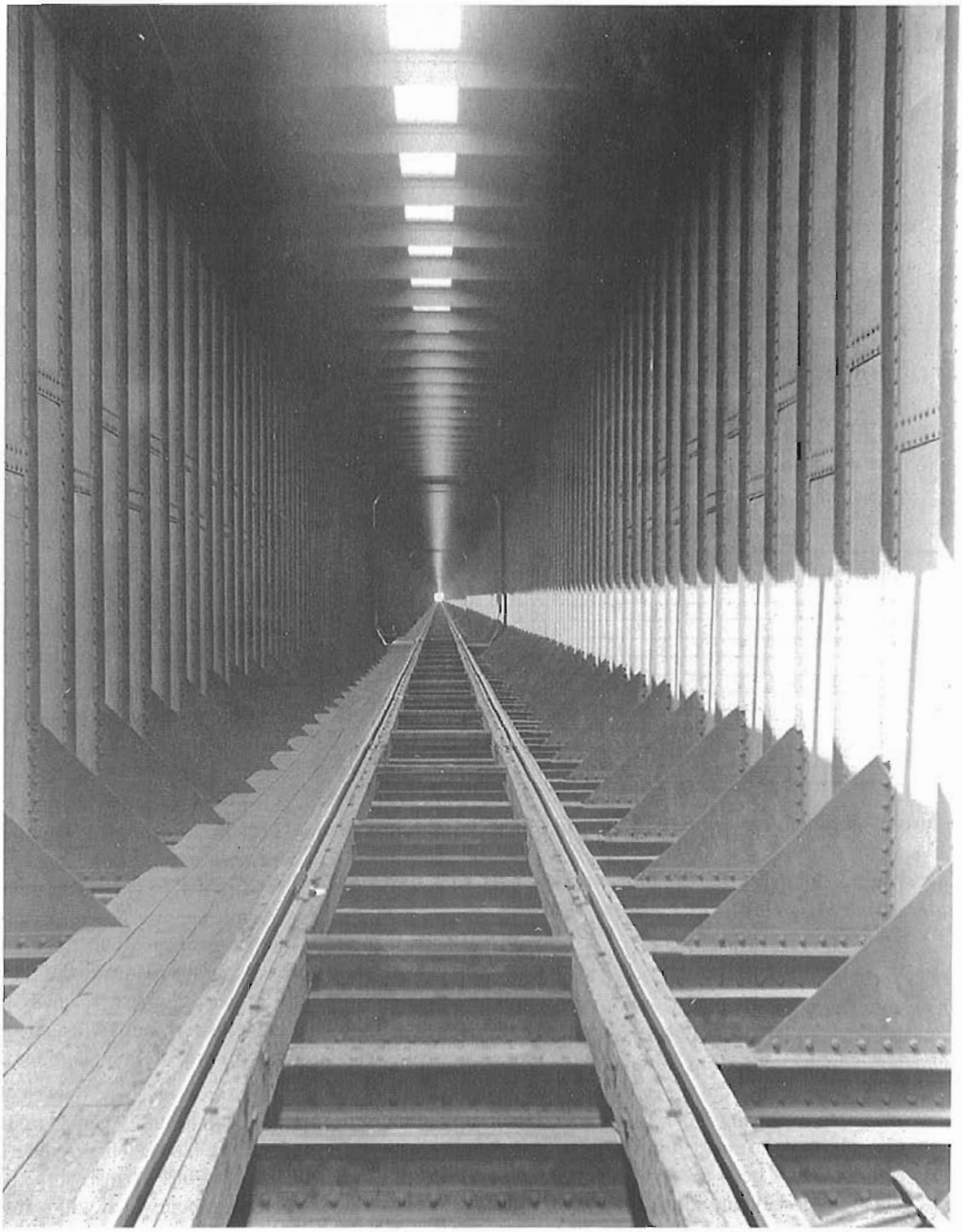
The masonry of the piers is being extended on the upstream side, to meet the requirements of the enlarged superstructure. but this addition is only above the water table of the cutwaters of the piers, as the present foundations are ample for the new work. The extension varies from 21 to 25 ft. On the downstream side the piers are being extended upward in line with the old masonry so as to give the additional width required for the new bridge. The masonry is of limestone ashlar, and the contractor for the extension of the piers is William Gibson M.P., of Beamsville, Ont., who has done a great deal of bridge and culvert work for the G.T.R., as well as the approaches to the Sarnia tunnel. A part of the walls and portals of the abutments of the bridge had to he taken down, and the upper portions of the piers (at their south ends) are also being taken down to such an extent as to admit of lengthening the piers as above described.

Examination of the masonry showed that the material removed would he unsuitable for use for the external masonry, and it was thought it might be employed for the backing, but when it was removed it was found to be quite unsuitable, as it crumbled under slight pressure. Each course of the new masonry is to be of the same depth as the course of the old masonry of which it becomes an extension, and all the masonry will be built of dimension stone, all faces being pick or hammer dressed. The vertical joints in each course must overlap those in the course below by at least 12 ins. The backing will be of squared or dimension stone, of the same thickness as the face stones. Following is an abstract from the specifications for the masonry work:

The face of the stones forming the ice breakers shall have a 2-inch margin draft all round, and shall he dressed off between to a uniform surface with a point or pick. All these face stones are to be clamped together, both vertically and

horizontally, with iron. The horizontal clamps are to be 2 1/2 ins. wide, 1/2 in. thick, 24 ins. long; these are to be turned down 2 1/2 ins. at each end, and embedded their whole length and thickness in the stone. The vertical bolts are all to be 1 in. diameter, and to pass through the horizontal clamps and the vertical joints of the stones, to be let into the course below at least 9 ins. and to be secured thereto by fox-tail wedging.

Coping stones of piers and bridge-seats of abutments shall not be less than 5 ft. in length, nor less than 30 ins. in width. The top and face of each stone to have a 2-in. tooled margin draft, and to be neatly bush-hammered between. String courses and pedestals to be dressed in the same way as copings. The sides and ends shall be dressed so that vertical joints shall not exceed 1/4 in. in width. The ends will he fastened together, on top, by clamps 12 ins. long, 2 ins. wide and 3/4 in. thick, let 3 ins. into each stone, two to a joint, and to be placed where directed, the whole of these stones to be set in full Portland cement mortar, made in the proportion of 1 part cement to 1 of sand.



A view of the "stygian interior" of the old Victoria Bridge in the spring of 1897. Note the slot cut in the roof for ventillation purposes. National Archives of Canada, photo No. PA-202498.

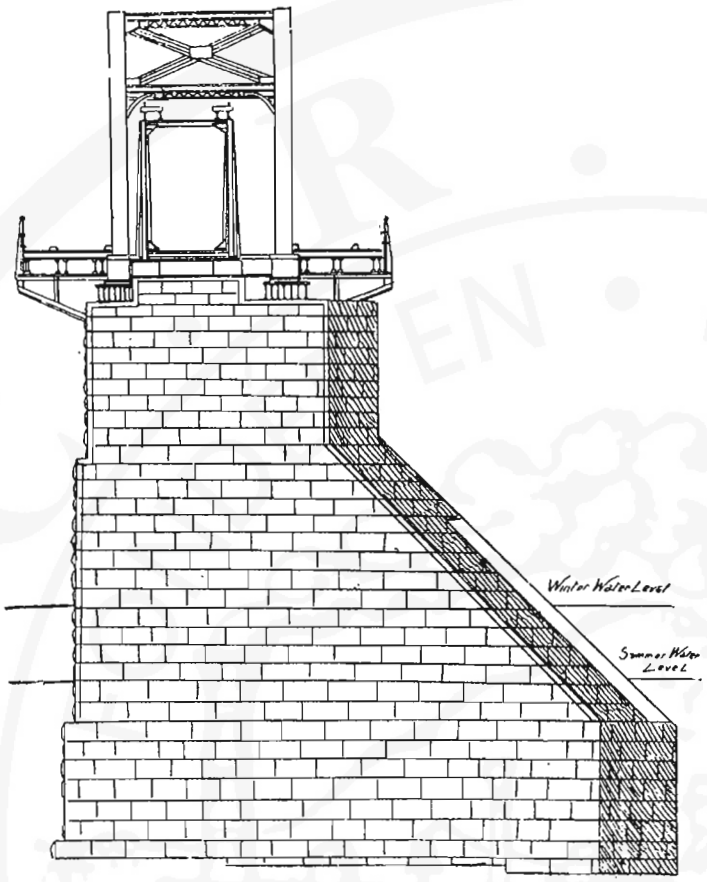
Every stone of the masonry must he set in a full bed of mortar and beaten with a heavy wooden maul until a solid bearing has been secured, the vertical joints must be fully flushed and filled up, using for the purpose "swords" or rammers, and where necessary to insure perfect filling, grouting must be resorted to. Each course must be properly levelled throughout its whole extent.

The mortar must be composed of the best Portland cement, and clean, sharp, coarse and properly screened sand, thoroughly mixed in approved proportions; these will be generally 2 parts of sand to 1 of cement, but they may be varied at the option of the engineer, according to the quality of the material. The cement and sand must he well mixed in a dry state; then enough water must he added to make mortar of a consistency that can be properly handled by a trowel. Mortar must be made in small quantities and only as required. Re-tempering of mortar that has partly set will not he permitted.

The face joints of the masonry must he raked out to a depth of 1 1/2 ins. and pointed with pure cement mortar.

Mr. Gibson is allowed the use of the company's rails on the top of the bridge covering, on which a repair car had formerly been run, and a consequence the work is being carried on in a manner astonishing in its simplicity.

The stone is reduced to its proper dimensions at Mr. Gibson's quarry at Crookston. near Madoc, Hastings County, and is transported on flat cars to the Point St. Charles end of the



CROSS SECTION 11TH PIER AND 12TH SPAN, VICTORIA JUBILEE BRIDGE, MONTREAL,

This drawing compares the size of the old and new superstructure. Railway and Shipping World, December 1898.

bridge, where a powerful steam derrick picks it up block by block and places it upon the car on top of the bridge covering. The car is moved by steam power to a point directly over the pier upon which the masons are at work. Here a travelling derrick takes the stone from the car and lowers it over the side of the bridge to the position that it is destined to occupy in the masonry, and its adjustment follows. One unacquainted with the method that has been adopted might picture to himself a huge pile of false work and scaffolding or a flotilla of barges as the necessary accessories of an undertaking so great. To the visitor the absence of anything of the kind is as much of a surprise as is the simplicity of the plan that has been adopted. The bridge is supported by 24 piers and 2 abutments. The piers vary in height from 30 feet at the ends of the bridge to 60 feet on either side of the central span, the increased altitude being necessary to allow of the passage of vessels up and down the river.

THE SUPERSTRUCTURE

This will consist of 24 spans of pin-connected, through steel trusses, each 254 ft. long, centre to centre of end pins, and one of 348 ft. over the steamboat channel. The trusses will carry two railway tracks to be used by ordinary steam railway trains, as well as by electric railway cars, and the floor beam system will be extended beyond the trusses sufficiently to carry a 10 ft. roadway and a 5 1/2 ft. sidewalk on either side.

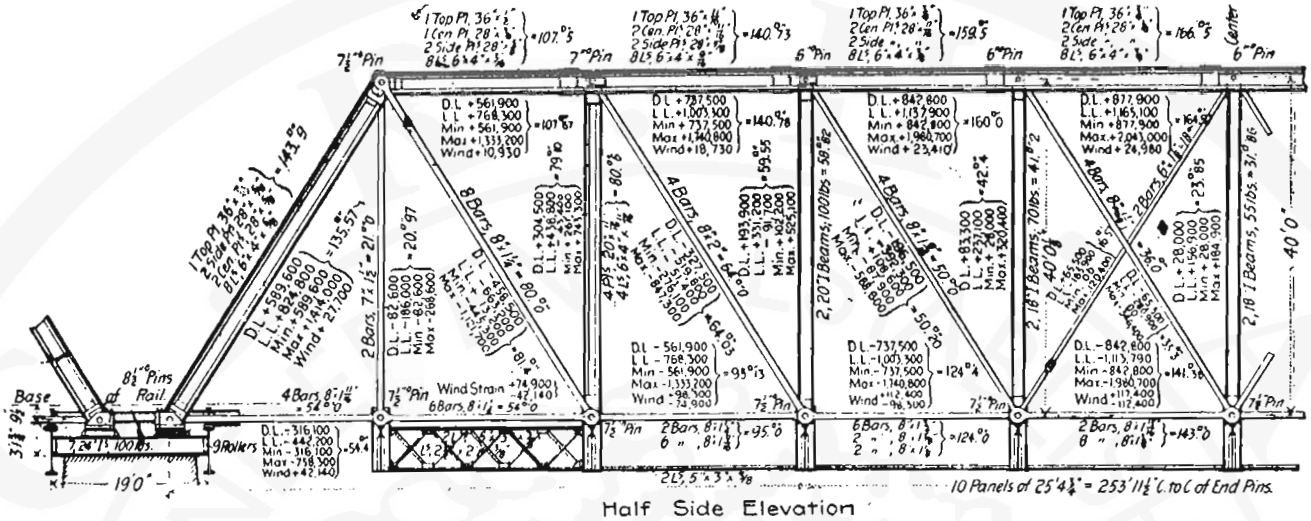
The details of one of the 254 ft. spans are shown in the drawing opposite. It has parallel chords and inclined end posts, and is divided into two panels of 25 ft. 4 1/4 ins. centre to centre of pins, the depth of truss is 40 ft., centre to centre of pins, and the width between trusses is 31 ft. 2 ins. centre to centre. The top chord is of trough section, 28 ins. deep, having four web plates, a top cover plate and eight flange angles. The pins in this chord are 6 ins., 7 ins. and 7 1/2 ins. diameter. The posts are of I-beams and built-up sections, and the diagonals are eye-bars, with turnbuckles on the counters in the two middle panels. The bottom chord is composed of 8 in. eye-bars, with 7 1-2 in. pins, the thickness and number of bars varying with each panel. The end pins are 8 1/2 in. in diameter. The floor beams are plate girders 66 ft. 3 ins. long, suspended from the pins by I-beam hangers, the girders extending beyond the trusses to carry the roadways and sidewalks. The girders are connected by longitudinal and diagonal bracing. the trusses will be connected by transverse struts between the top chords, and between the posts, the latter struts being 15 ft. 1 in. . below the top chords, giving a clear headway of 23 ft. 1 1/2 ins. from base of rail to the lower struts of the overhead lateral bracing. There will also he the usual horizontal and vertical lateral bracing, as shown in the plan and cross section.

Upon the central portion of these floor beams are carried 8 lines of stringers of 24 in. I-beams, 4 under each track, 2 ft. 5 1/2 ins. centre to centre, the inner lines being connected by vertical diagonal bracing. Across these beams are laid pitch pine ties, 10 X 10 in., 4 in. apart in the, clear, these ties being long enough to carry both tracks. There will be two tracks of standard gauge, 13 ft. centre to centre, with a guard timber outside each rail. On each cantilever end of the floor beams will be two lines of 20 in. I-beams for the roadway, and a 15 in. channel on the end of the beam. These carry the roadway timbers, which will he similar to the track ties, but 12 ins. apart. Upon these timbers will be laid a flooring of 4 in. plank for the roadway and sidewalk.

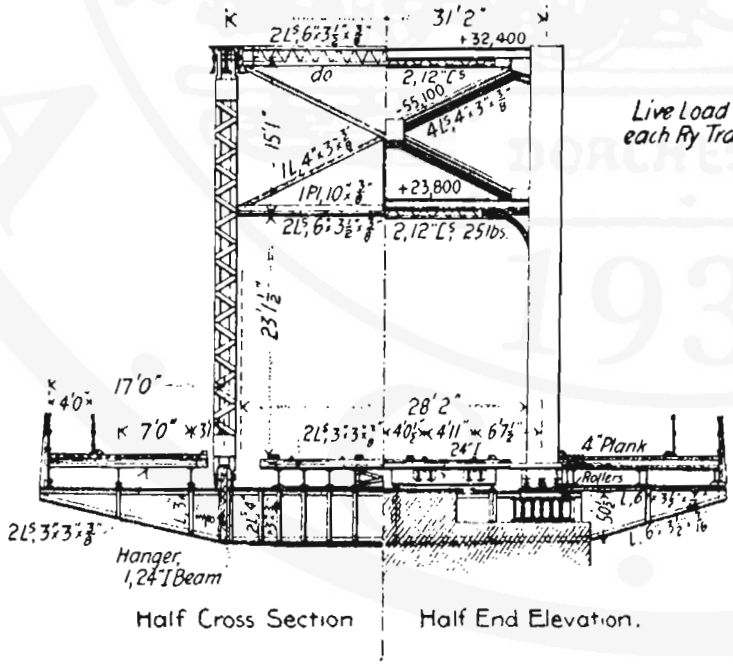
Across each end of each masonry pier (parallel with the bridge) will he laid seven 24 in. I-beams (100 lbs. per foot), 19 ft. long, the ends of which will be riveted to the end floor beams. On each set of I-beams will be two wall plates 4 x 5 ft., 1 1/2 ins. thick, upon which will rest the shoes of the trusses. The shoes at the expansion end will have nine rockers, 4 ft. 3 in. long, 3 3/4 ins. wide, and 7 ins. high, the top and bottom having curved faces. A variation in temperature to the extent of 150 degrees is provided for in the expansion bearings. Between the floor beams, carried by the I-beams on the piers, are 15 in. I-beams which support the floor system across the pier.

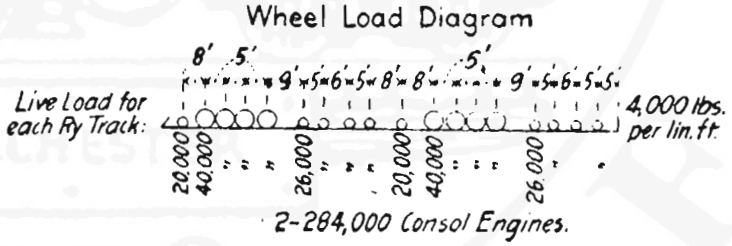
The channel span of 348 ft. will have curved top chords to the main trusses, but the plans of this span have not yet been fully adopted.

The railway tracks will be used not only for ordinary trains, but also for electric cars, thus affording a more frequent service between Montreal and several small towns on the south shore. These cars will be run between the times of the regular trains, and interlocking switch and signal plants will be installed at each end of the bridge at the junction of the electric railway with the bridge tracks.



DETAILS OF TRUSS SPANS FOR VICTORIA JUBILEE BRIDGE.





The trusses are designed for the following loads:

1. The total weight of metal in them, amounting to 5,910 lbs. per linear foot of span.

2. The weight of the wooden floor beams, planking, sidewalks, guard timbers, railings, rails and fastenings, etc., amounting, in the aggregate, to 2,800 lbs. per linear foot. This, with the weight of metal, gives the assumed dead load of 8,710 lb. per linear foot of span.

3. A moving load in either direction on each of the two tracks, consisting of two consolidation engines and tenders coupled, each weighing 284,000 lbs. on a length of roadway of 54 ft., followed by a uniformly distributed train load weighing 4,000 lbs. per lineal foot. The distribution of the engine loads is shown in the wheel load diagram above.

4. A moving load in either direction on each of the roadways of 1,100 lbs. per lineal foot.

5. A live load on each footwalk of 200 lbs. per lineal foot.

To provide for wind strains and vibrations in the 254 ft. spans, the bottom lateral bracing is proportioned to resist a lateral force of 450 lbs. per lineal foot of span, 300 lbs. of this being considered as a moving load and as acting on a train of cars at a line 8 ft. 6 ins. above the base of the rail. The top lateral bracing is proportioned to resist a lateral force of 150 lbs. per lineal foot of span. For wind strains in the 348 ft. span, 35 lbs. are added in each of the above cases.

Following are some extracts from the specifications:

Bed plates (on masonry) for the trusses are to be made of cast steel. These castings shall be free from blow-holes, true to pattern and of a workmanlike finish. When tested in specimens not more than 2 ins. long and of at least 1/2 in. uniform sectional area, it must give the under-mentioned results:

Ultimate strength..... 67,000 lbs.
Elastic limit..... 34,000 lbs.
Elongation in 2 ins..... 20%.

The "traveller" running along the top of the old bridge on June 29, 1897 (nine days after Queen Victoria's Diamond Jubilee). National Archives of Canada, photo No. PA-202499.

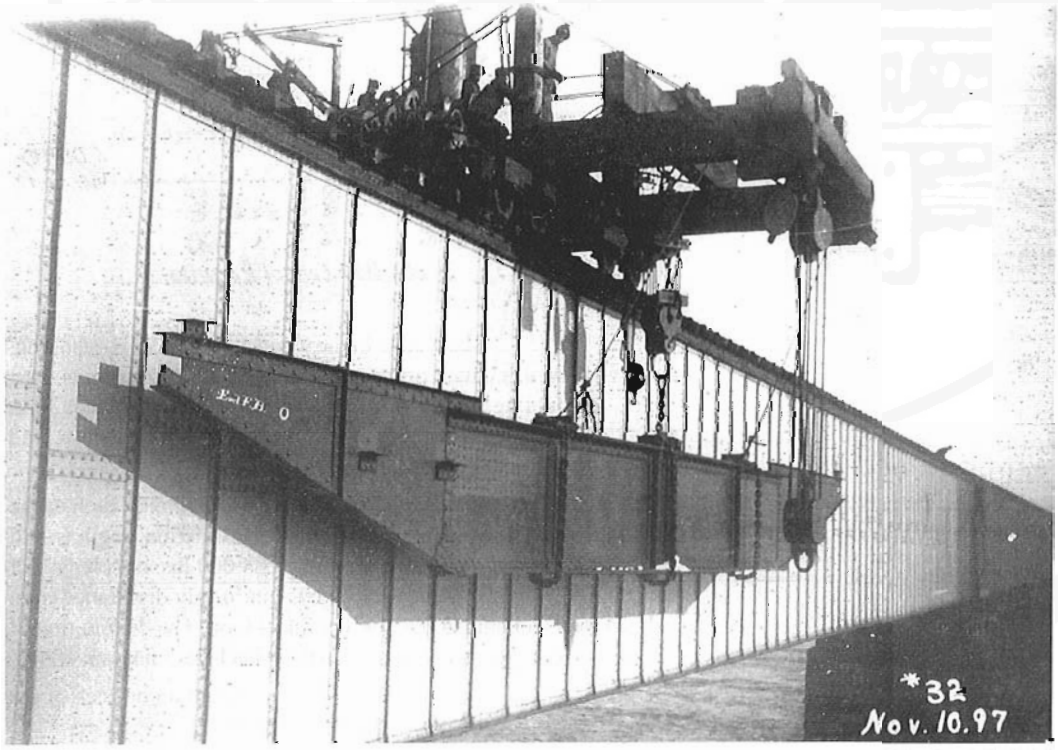
All steel must be made by the open-hearth process, and shall contain no more than 0.08% of phosphorus in acid steel, or 0.04% in basic steel, and each kind must be of uniform quality.

All tests for tensile strength, limit of elasticity and ductility shall he made on samples cut from the finished material after rolling, and shall be at least 12 ins. long, and shall have a uniform sectional area of not less than 1/2 sq. in. All broken samples must show a silky fracture of uniform color.

When material is to be annealed or otherwise treated before use, the specimen representing such material is to be similarly treated before testing.

Soft steel shall have an ultimate strength of 54,000 to 62,000 lbs. per sq. in., with an elastic limit not less than half the ultimate strength and a minimum elongation of 25% in 8 ins. This steel must bend double, when cold, to close contact without sign of fracture on the outside.

Rivet steel shall have an ultimate strength of 50,000 to 58,000 lbs. per



Lowering one of the new cross members down the side of the old tube. November 10, 1897. National Archives of Canada, photo No. PA-202503.

sq. in. and an elongation of 25%, and shall stand the bending test above specified.

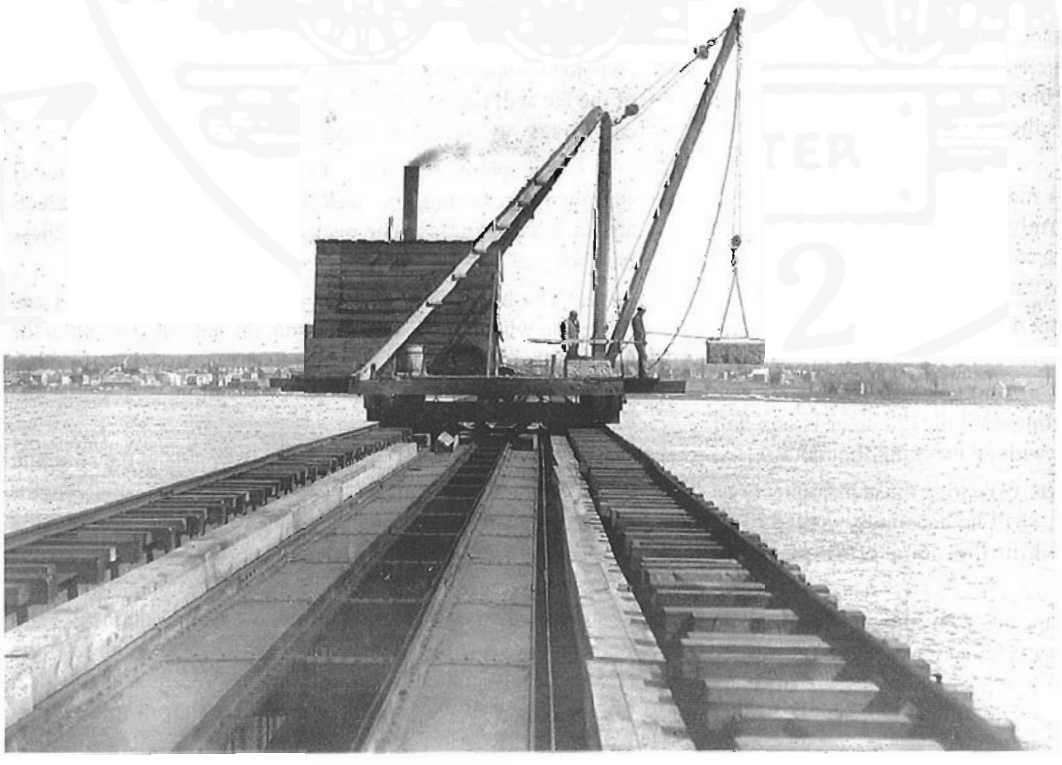
Medium steel shall have an ultimate strength, when tested in samples of the dimensions given above, of 60,000 to 68,000 lbs. per sq. in., an elastic limit of not less than half the ultimate strength, and a minimum elongation of 22% in 8 ins.

This steel must stand bending 180 degrees to a curve whose inner radius is 1 1/2 times the thickness of the sample, without cracking on the convex side, either when cold, hot, or after being heated to a cherry-red and cooled in water of 60 degrees F.

Eye-bars of 8 sq. ins. of area or less must elongate 15% in a gauged length of 20 ft.; must show a minimum, elastic limit of 30,000 lbs. per sq. in., and develop a minimum ultimate strength of 58,000 lbs. per sq. in. For eye-bars of greater area, not exceeding 20 sq. ins. in section nor 2 ins. in thickness of bar, a reduction will be allowed to a minimum requirement of 56,000 lbs. ultimate strength, 29,000 lbs. elastic limit, and an elongation of 10% in a gauged length of 10 feet.

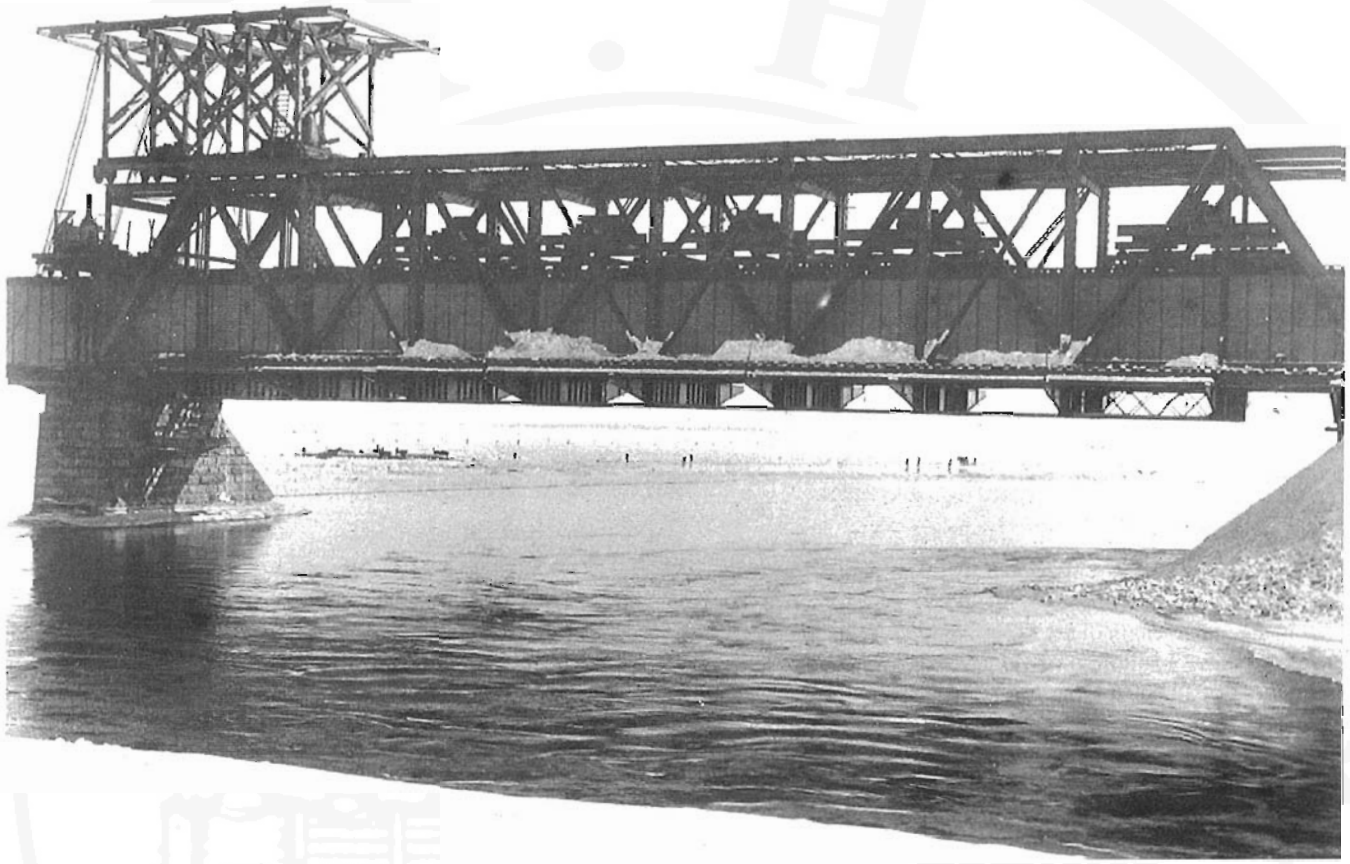
ABOVE: In March 1898, one of the piers is being prepared for widening by building up the upper portion of the pier to floor level. Note that the lower portion of the pier did not have to be widened. The pier in the background has already been partially built up.
National Archives of Canada, photo No. PA-202500.

BELOW: Lowering a stone for building up one of the piers. March 30, 1898.
National Archives of Canada, photo No. PA-202502.



Eye-bars tested to destruction and fulfilling the above conditions shall be accepted even though they break in the head, if not over one-third of the bars tested break in this manner.

Pins made of either soft or medium steel shall, on specimen test pieces cut from finished material, fulfill all the requirements of the grade of steel from which they are rolled, excepting the elongation, which shall be decreased 5% from that specified.



The completion of the first new span; March, 1898. Note the vertical steam boiler on the left. This supplied steam to the hoisting machinery, and powered the traveller. National Archives of Canada, Photo PA-202504.

Pins up to 6 ins. diameter shall be rolled. Pins exceeding 6 ins. in diameter shall be forged under a steam hammer striking a blow of at least 5 tons. The blooms to be used for this purpose shall have at least three times the sectional area of the finished pins.

After pins have been manufactured to diameter, they shall he carefully and uniformly heated to a medium orange color in a closed furnace not in contact with the fuel, after which they shall be buried in warm, day sand or ashes until cool.

All pins more than 5 ins. diameter shall be bored through the centre.

Punched rivet holes, pitched two diameters from a sheared edge must stand drifting until the diameter is one-half larger than the original hole, without cracking the metal.

All holes for field rivets, excepting those in connections for lateral and sway bracing, shall he accurately drilled to an iron templet, or reamed while the connecting parts are temporarily put together.

The several parts composing a riveted member shall be so accurately punched and reamed, that upon being assembled, connecting holes shall he truly opposite. If they are not they may, if the inaccuracy does not exceed 1/16 in., be still further reamed to bring them exactly into line.

The heads of eye-bars and enlarged ends of rods shall be made by upsetting or forging into shape. Welds in the body of the bar will not be allowed, except to form loops of laterals, counters, sway rods or unimportant details.

The eye-bars shall be annealed, and must be perfectly straight before boring, and must be free from all flaws or defects and of full thickness in the necks. Welds in the body of these bars will not he allowed.

The heads of these bars must be so proportioned and made that when tested to destruction. the bars shall break in the body of the original bar rather than at any part of the head or neck, and shall be made by upsetting, rolling or forging into shape.

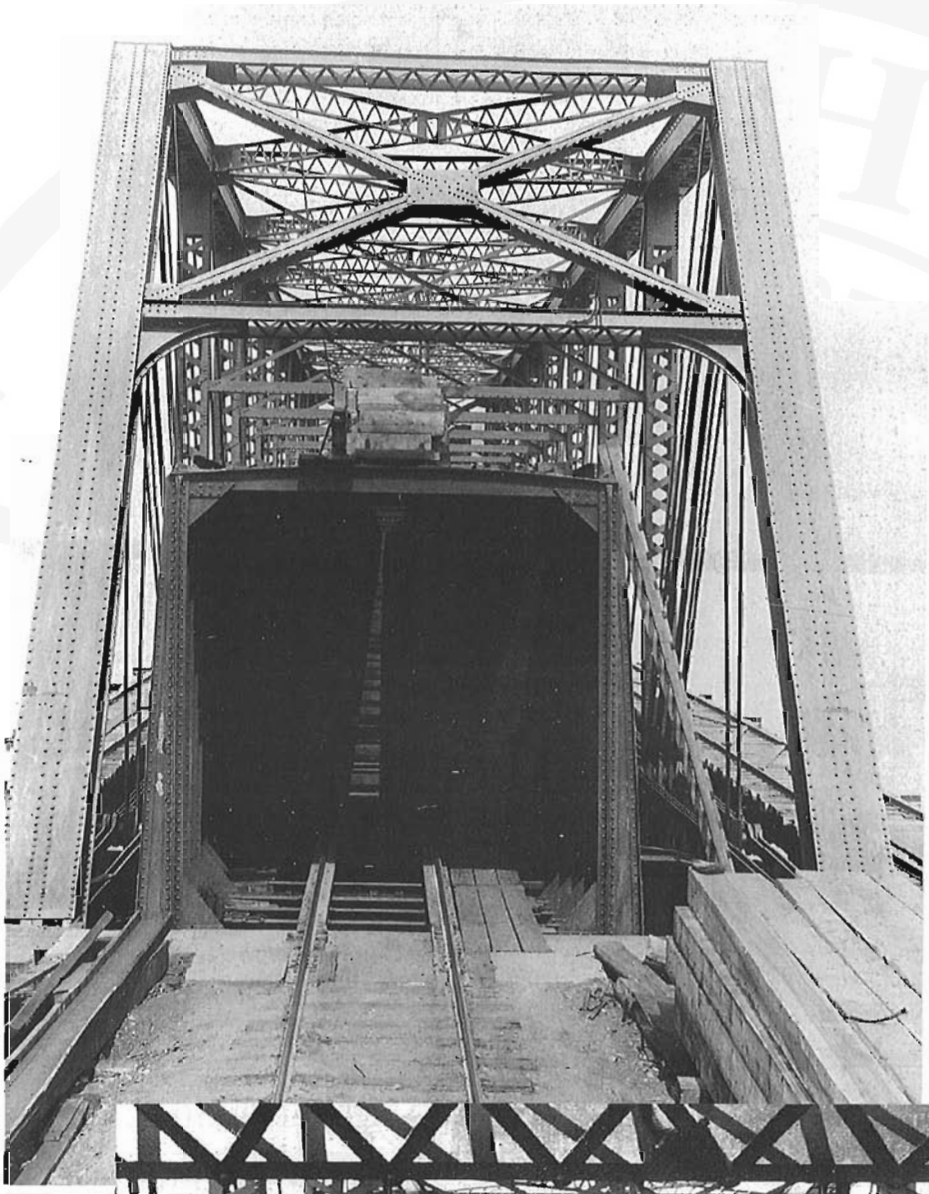
Bars which are to be placed side by side in the structure shall be bored at the same temperature and of such equal lengths that on being piled on each other the pins shall pass through the holes at both ends without driving.

The pins shall be turned accurately to gauge and shall be straight or smooth; chord pins up to 4 1/2 ins. diameter shall fit the pin holes within 1/50 in.; for pins of a larger diameter the clearance may gradually be increased to 1/32 in. for pins of 6 ins. diameter and over. Lateral pins shall fit the pin holes within 1/32 in.

The heavy equipment used to hoist the parts of the new spans. The span behind has been completed. Judging by the position, this appears to have been in May, 1898. Note the skyline of Point St Charles in the background. National Archives of Canada, photo No. PA-202506.

STATISTICS COMPARING THE OLD AND THE NEW VICTORIA BRIDGE

ITEM	OLD BRIDGE	NEW BRIDGE
Length of iron or steel work...	6,592 feet.	6,592 feet.
Total length, including approaches...	9,144 feet.	9,144 feet.
Number of spans....	25.	25.
Number of piers...	24.	24.
Thickness of centre piers at summer water level...	28 feet	28 feet.
Thickness of side piers at summer water level...	18 feet.	18 feet.
Length of centre span...	330 feet.	330 feet.
Length of side spans...	242 feet.	242 feet.
Quantity of masonry (piers and abutments)...	100,000 cu. yds.	100,000 cu. yds.
Height of centre span...	22 feet.	60 feet.
Height of side spans...	18 1/2 to 22 feet.	40 feet.
Width of spans...	16 feet.	31 feet 2 inches.
Extreme width of bridge.	Not given.	66 feet 8 inches.
Height from water to underside of centre span...	60 feet.`	60 feet.
Grade of bridge to centre...	1 in 130.	1 in 130.
Total weight of superstructure...	18,088,000 lbs.	44,000,000 lbs.
Cost of bridge...	$7,000,000.	$2,000,000 (new work).



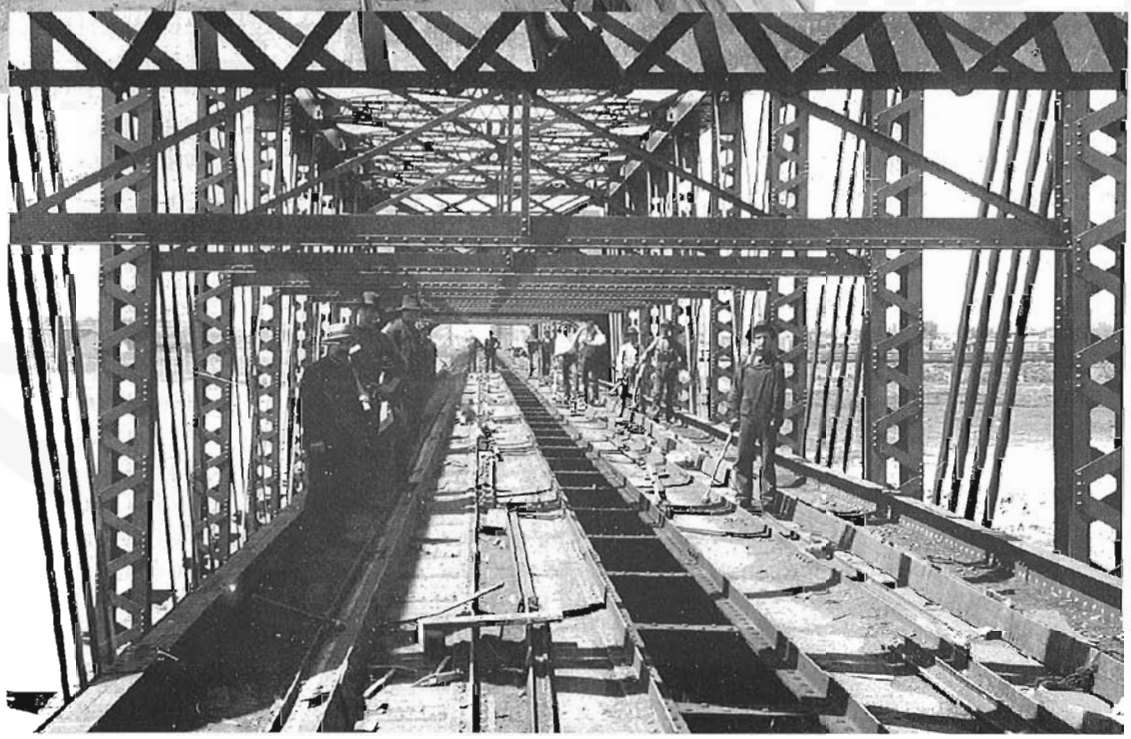
The open sides of all compression members shall be stayed by batten plates at the ends, and diagonal latticework at intermediate points. The batten plates must be placed as near the ends as possible, and shall in length be not less than the greatest width of the member, or 1 1/2 times its least width. The size and spacing of the lattice bars shall be proportioned to the size of the member.

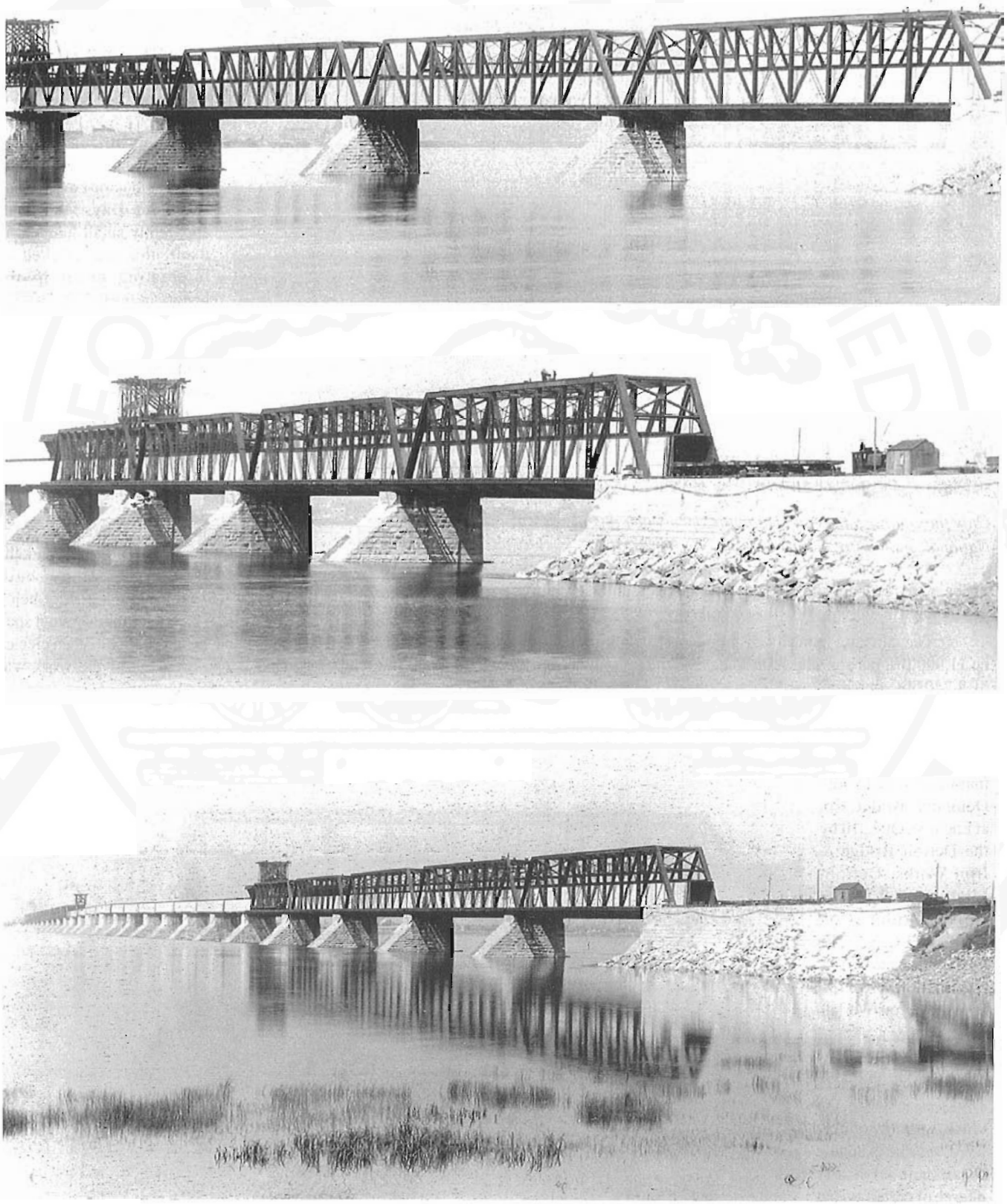
The trusses shall be given a camber, by making the panel lengths of the top chord longer than those of the bottom, in the proportion of 1/8 in. to every 10 ft.

The shop painting will include 1 coat of paint to all inaccessible parts, and 2 coats after erection, all other parts being given 1 coat of raw linseed oil. Pin holes and planed surfaces will be coated with white lead and tallow. In the field the structure will be given 2 coats of paint. All paint will consist of

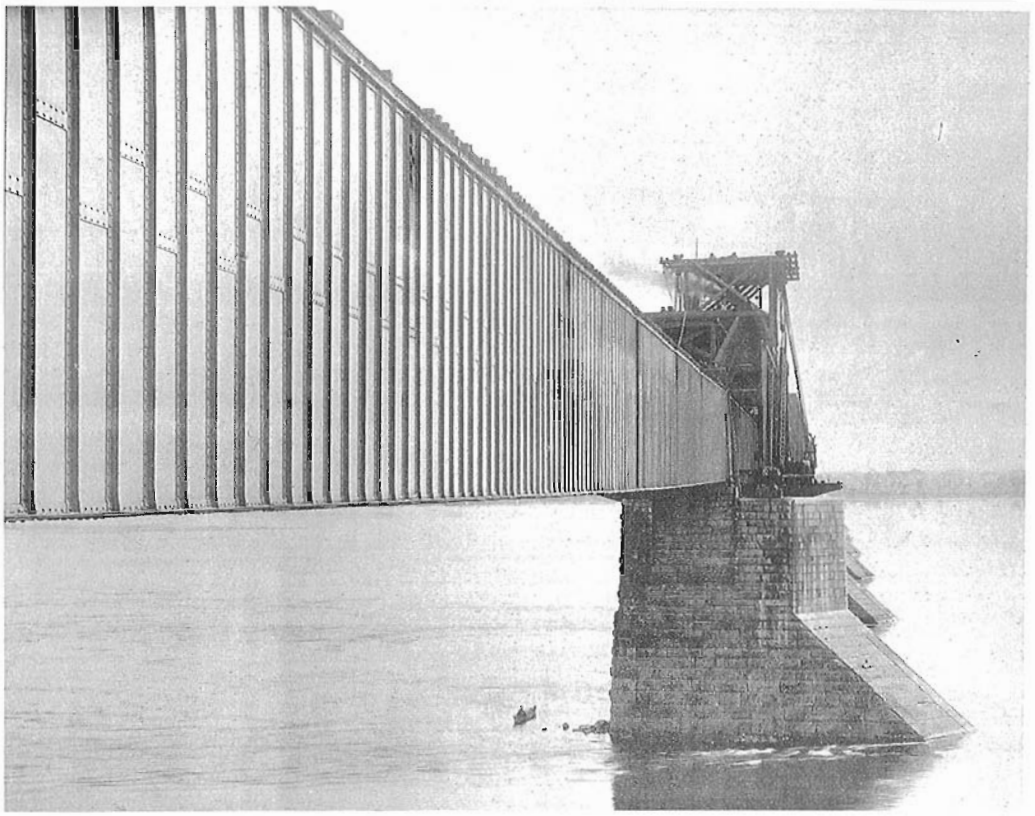
LEFT: The great difference in size between the old tube and the new span is dramatically shown by this photo taken from the Montreal end in June 1898. National Archives of Canada, photo No. PA-201438.

BELOW: The top of the old structure as seen inside a newly-completed span. June, 1898. Private Collection.





Three photos showing ten days progress at the St. Lambert end. Top: May 28, 1898; centre: June 1, 1898; bottom: June 7, 1898. Eleven spans still to go! National Archives of Canada, photos PA-202505, PA-202507, PA-201437 respectively.



Only the centre span remained in the open when this photo was taken in July 1898. National Archives of Canada, photo No. PA-202501

12 lbs. pure red lead, and 10 oz. lamp black per gallon of paint, thoroughly mixed with raw linseed oil.

The carrying capacity of the reconstructed bridge will be 11,000 lbs. per running foot, as against the present capacity of 2,240 lbs. per running foot.

Six of the trusses are being manufactured by the Dominion Bridge Co. at Lachine, Que., 10 by the Detroit Bridge & Iron Works, Detroit, Mich , and 9 by the Union Bridge Co., New York City. The whole 25 spans will be erected by the Detroit Bridge & Iron Works.

The Chief Engineer, in response to our enquiry [March, 1898] as to when the work will be completed, says he is unable to answer with any degree of certainty, but he hopes it will be finished this year.

THE COMPLETION OF THE BRIDGE

On December 13, 1898, the second track across the new Victoria Jubilee Bridge over the St. Lawrence River at Montreal was completed, and the bridge opened for traffic with a double track, the first train to pass over it being the St. John's local, with passenger engine No. 265, Conductor Lavigne and Engineer Day. While of apparently small moment in itself, this fact marked an interesting event in the history of the G.T.R. System, as well as in the history of the development of the commerce of both Canada and the city of Montreal.

The Chief Engineer of the new bridge was Jos. Hobson, Chief Engineer of the G.T.R. System. The [steel] work was commenced in Oct. 1897, by the erection of the first span on the west end; the structure being built completely around the tube of the old bridge, the latter being cleverly utilized as a roadway on which a temporary steel span was moved out to the first pier, and the new structure then erected outside the temporary span. The progress of the work was

As was to be expected, the big job drew many sightseers. This interesting view was taken from a passenger boat in July, 1898. Art Work on Montreal by William H. Carre, 1898.

delayed for two months during the winter of 1897-8, owing to very severe weather, and the actual time of construction only extended over about 8 months; during that time the enormous traffic of the Grand Trunk was delayed but very little, practically nothing to speak of, the longest time on any one occasion that the line was closed to traffic being about 2 hours, and the total length of time closed during construction being about 20 hours. This is a very remarkable result, when the following facts were taken into consideration:

While the old bridge, entire, weighed 9,044 tons, the new bridge weighs 22,000 tons. The total length of bridge is 6,592 ft; number of piers, 24; number of spans, 25; length of central span, 330 ft.; length of side spans, 242 ft. While the width of the old bridge was 16 ft., the width of the new bridge is 66 ft. 8 ins.; the height of the old bridge superstructure was 18 ft.; the height of that of the new bridge over all is from 40 to 60 ft.

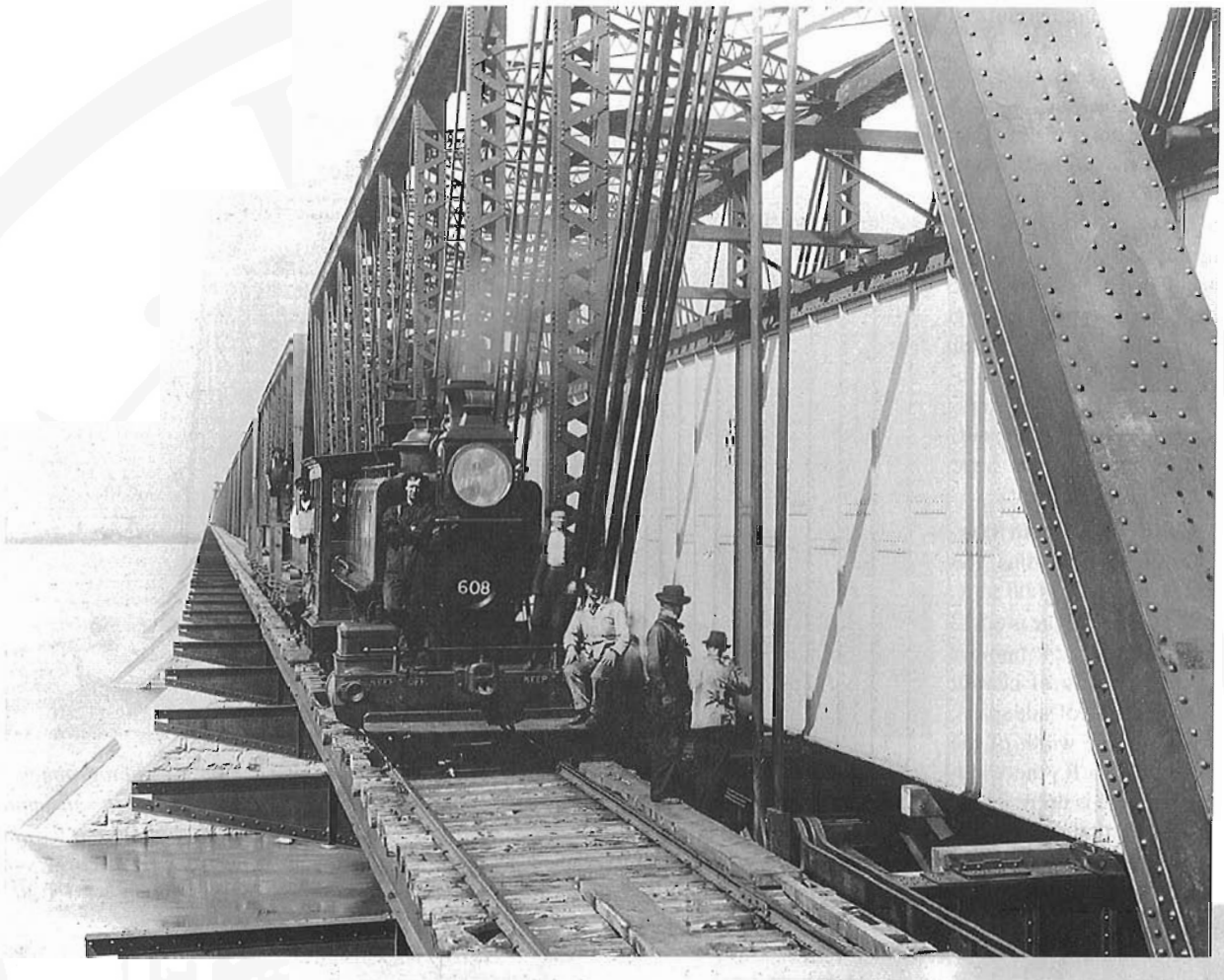
It's now July 5 1898, and a group of workers take a brief break to pose for the photographer. There is still much work to be done, however. Three spans remain to be built, including the all-important centre one. The old tube is still in use, but some of its roof has been removed and in a few months it will be dismantled. Note the temporary tracks on the side roadways; used to carry supplies without tying up the main line. National Archives of Canada, photo No. PA-202511.

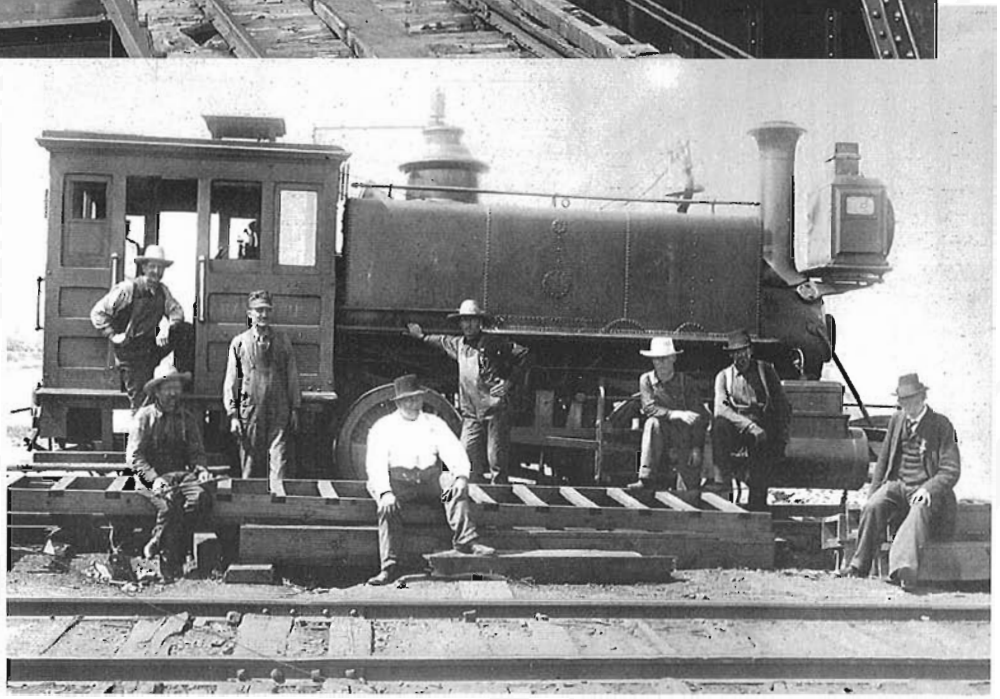
This spectacular view was taken near the centre of the bridge on August 7 1898, as the construction of the steelwork neared its completion. A temporary movable structure has been built inside the main spans until the much larger centre span is finally in place. National Archives of Canada, photo PA-202510.

The total cost of the new bridge, which provides double tracks for railroad trains, and driveways for vehicles on each side, was about $2,000,000, the contract price of the old Victoria Bridge was $7,000,000.

The superstructure of the bridge, exclusive of its own weight, in which are included floors, railway tracks, guard rails, etc., is designed to carry the undermentioned moving loads : (1) trains running in both directions, consisting of 2 consolidation engines and tenders, coupled, of an average weight of 5,200 lbs. per foot of their length, followed by a car load of 4,000 lbs. per foot; (2) a moving load on each carriageway of 1,000 lbs. per foot. There is no limit set for the speed of either railway trains, or electric street cars, or of ordinary [horse-drawn] carriages.

The new Victoria bridge ranks, from an engineering standpoint, with the foremost structures of the age, as the bridge which it replaced ranked the foremost as a monument to the skill of the engineers and bridge-builders of the period in which it was built.

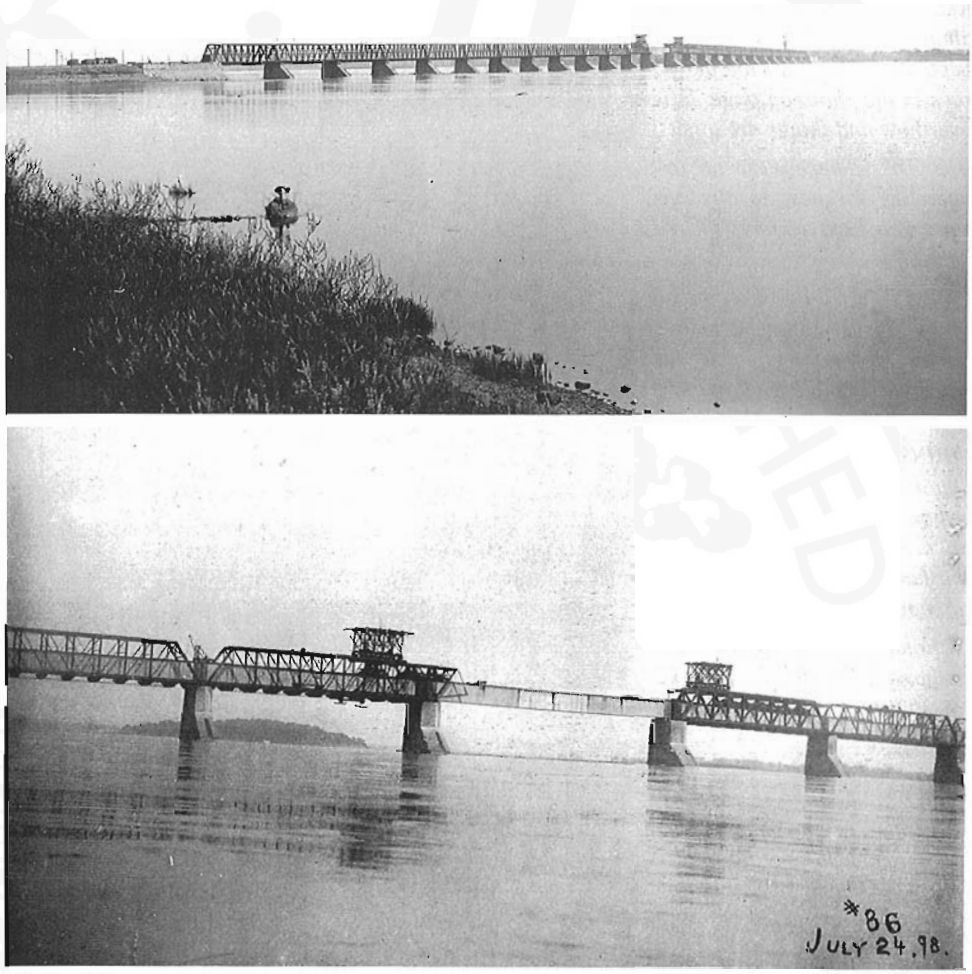




The opening of the double track on the new bridge marked an era in the handling of traffic over the G.T.R. System, for whereas the old bridge could accommodate a maximum of but 100 trains a day, as they were required to travel at a low rate of speed, and one train could not follow another until the preceding one was out, thus losing a considerable amount of valuable time during a day, the present bridge has almost an unlimited capacity in this repect, as trains can be moved swiftly, and follow each other in rapid succession, owing to the establishment of a modern electric block system. which will permit 2 or 3 trains on the bridge in each direction at the same time. This will enable the G.T.R. to handle with facility the large and constantly increasing freight business, which has heretofore been more or less hampered, owing to the limited capacity of the old bridge, as well as handling in a proper manner the large passenger business which constantly comes to and through Montreal, and with increase volume during the summer tourist season.

Two small locomotives used in the Victoria Bridge project, photographed in the summer of 1898. Number 608 was a former Great Western 0-4-2T switcher built by Baldwin in 1873, while 205 may have been converted from 1873 GTR 4-4-0 No. 385. The temporary track on the roadway supports is plainly visible. National Archives of Canada photos Numbers PA-201436 and PA-202516.

The view from the train while crossing the Victoria Jubilee Bridge is one of much grandeur, and if seen while approaching Montreal from the south shore cannot but arrest the artistic sense of the beholder. With the St. Lawrence river sweeping under this massive structure, with hundreds of steamboats, sailing vessels, steam tugs and crafts of every description, scurrying hither and thither on its waters opposite the harbor, and the City of Montreal, lying in its beautiful location at the base of Mount Royal as a background, forms one of those beautiful pictures which delight the eye of the artist and awakens the admiration of all. The massive stone warehouses that line the harbor for miles, the extensive manufactories, from whose tall chimney belch forth volumes of smoke, and which can he seen on the shores of the river as far as the eye can reach, tend to show that Montreal is the commercial metropolis of Canada. While speaking of Montreal, it may be said that when the old Victoria Tubular Bridge was completed in 1860, the population of that progressive city was, as already stated, between 60,000 and 70,000 and to-day the population is given as more than 300,000.



Another month's progress is depicted in these three photographs. In the top view, July 18 1898, all spans but the centre one are built. The middle photo, July 24 1898, is a more detailed view as work on the spans paused awaiting the delivery of the steel. By August 18 1898, lower photo, the new centre span was in place. National Archives of Canada, Photos PA-202517, PA-202509, PA-202518.

With the steelwork complete, it's time to dismantle the old superstructure.

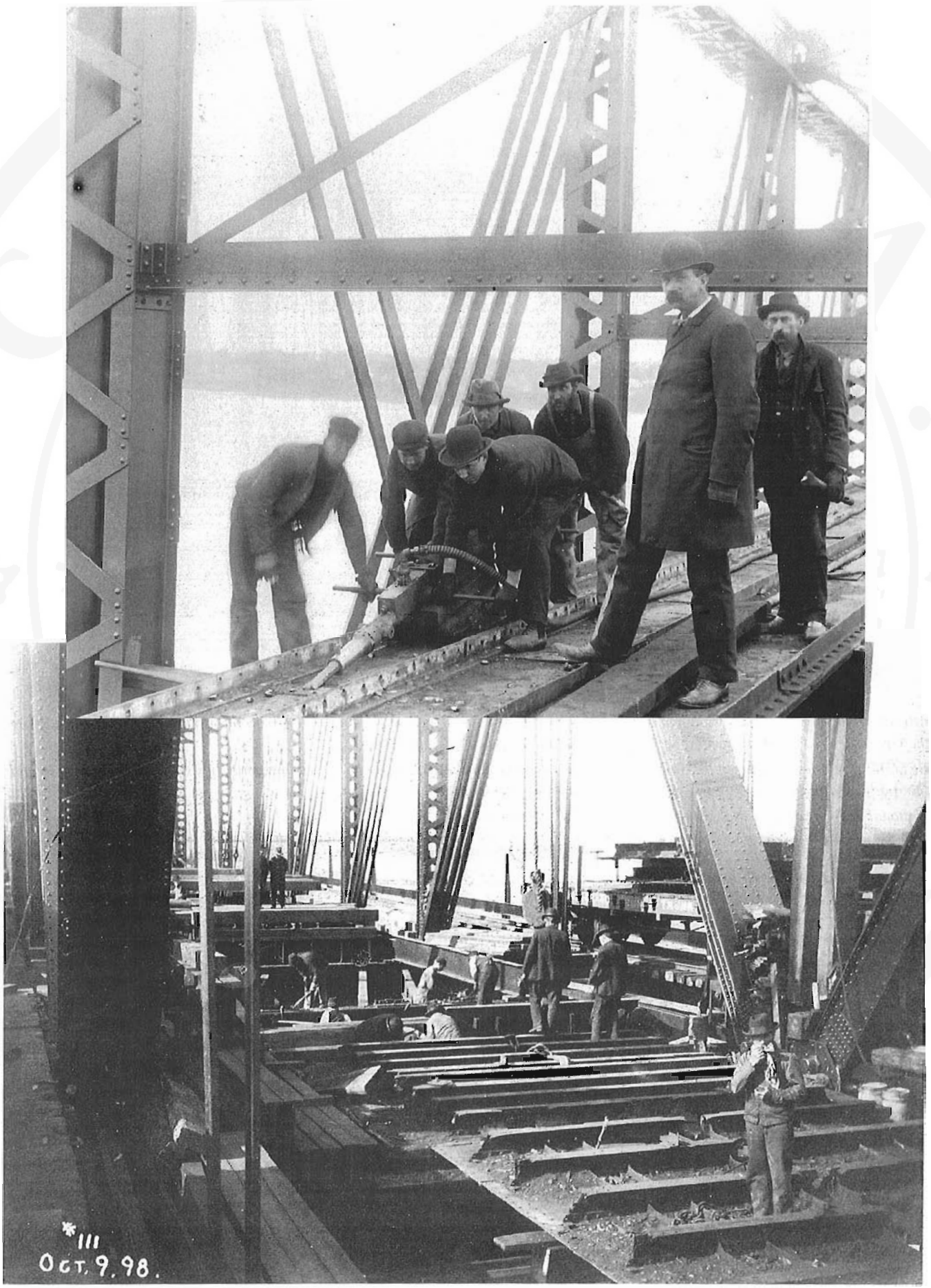
RIGHT· Taking a last walk along the top of the tube about September 1898. All the action seen in the photo on page 72 is over now and things are quiet.

BELOW· There were no ox-acetyline torches, so circular saws were used to cut up the old ironwork.

OPPOSITE, TOP· Shearing off the old rivits with a pneumatic chisel. The noise made by the saws and chisels must have been deafening!

OPPOSITE, BOTTOM: On October 9, 1898 workers were removing the last of the floor of the old structure. After 40 years the famous tubular bridge was no more.

National Archives of Canada, photos PA-202508, PA-202512, PA-202513, PA202514.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ABOVE: Looking along the bridge on November 21, 1898. The old structure is gone, and the second track is about to be laid. Note the Grand Trunk Van, number 7686, and flat cars on the temporary outside track.

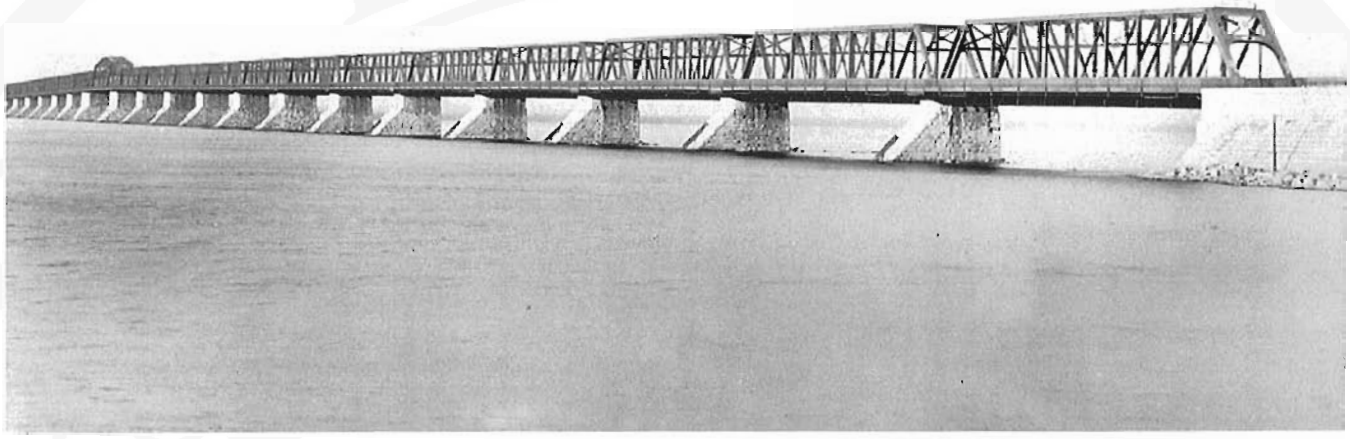
BELOW: This view was taken on November 22 1898, the day after the above photo. The construction gantries are still in place and the roadways are not yet built. Priority now is completing the double track.

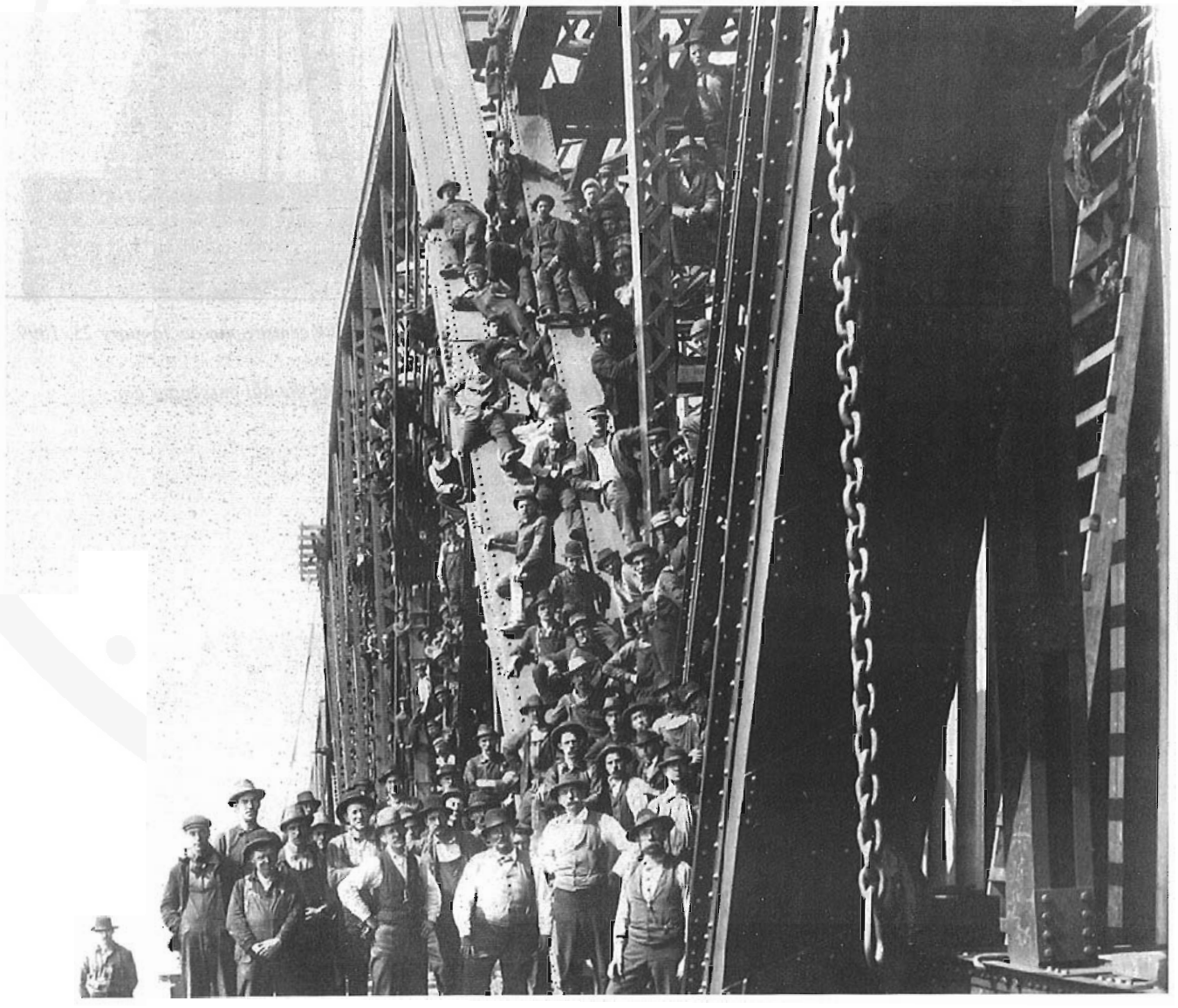
National Archives of Canada, photos Nos. PA-202520 and PA-202519.

ABOVE: The double track, and railings for the roadways are in place in this photo, taken at the centre span on January 23, 1899. Both tracks of the bridge had been in service for almost six weeks.

BELOW: The bridge, complete except for roadways and embellishments, in January, 1899. Note the old passenger car.

National Archives of Canada, photos Nos. PA-202521 and 202522.





OPPOSITE, TOP: The completed bridge photographed on December 14, 1899. The roadway opened December 1, 1899.

OPPOSITE, BOTTOM: A job well done! Some time in the autumn of 1898, before the old tubes were fully dismantled, many of the workers scrambled for a vantage point on one of the new spans as they were recorded for posterity. Though all are long dead, the work they built is still in use after more than 100 years and, with recently carried out renovations, will be good for many years more. Is your ancestor in this photo?

ABOVE: The Montreal end of the bridge on December 14, 1899. Note; this photo is shown larger on the back cover.

BELOW: The two memorial plaques affixed to the end of the bridge. One refers to the original bridge, the other to the new one.

National Archives of Canada, photos Nos. PA-202523, PA-202515, PA-202524, PA-202525.

ROYALTY INSPECTS THE NEW VICTORIA JUBILEE BRIDGE

The chief officials of the Grand Trunk Railway had the honour yesterday of being the last people in Montreal to bid farewell to their Royal Highnesses the Duke and Duchess of Cornwall and York, whose Canadian tour is soon to be completed. The fact that the King over forty years ago with his own hand sent home the last rivet in the Victoria bridge was brought to the notice of Their Royal Highnesses and they were pleased to accept the suggestion that a short stop should be made at the place where the first ceremony had been held. Thus another generation becomes identified with the bridge, and the improvements, which have been made in recent years, are commemorated.

The car used by the Prince of Wales on his visit in 1860, when he opened the original Victoria Bridge. CRHA Archives, CanCar Collection.

The arrangements made were well devised for the carrying out of the idea. The entrance to the bridge was decorated. A platform for the Royal party was placed on the centre span. This platform was mounted on four flat cars and was elaborately furnished and decorated. This portion of the bridge presented a pretty appearance as it was lavishly covered with bunting in the royal colours. The decorations included a large shield surmounted with a crown and bearing the rose, shamrock, thistle and maple leaf.

After 12 o'clock noon, no traffic of any character was allowed on the bridge and it was patrolled by police who also guarded the entrances. At 12:45, the train bearing the Governor-General, Sir Wilfred Laurier, and others passed by. Then came President Sir Charles Rivers-Wilson's car, the "Violet", containing the leading officials of the Grand Trunk Railway, who assembled on the platform to await Their Royal Highnesses. It appears that the Grand Trunk had hoped to have the Royal couple inspect the bridge as the "Violet" had been handsomely refurbished and its observation apartment enlarged for their use during such an inspection.

Those present were Messrs George B Reeve, Second Vice-President and General Manager; Frank W Morse, Third Vice-President; W Wainwright, General Assistant and Comptroller; F H McGuigan, General Superintendent; Joseph Hobson, Chief Engineer; W E Davis, Passenger Traffic Manger; John Loud, Freight Traffic Manager; W McWood, Superintendent Car Department; W D Robb, Superintendent Motive Power; W McNab, Assistant Engineer; and H R Charlton, Advertising Agent. At 1 o'clock, the hoisting of the Royal Standard proclaimed the arrival of the train.

Their Royal Highnesses were received at the platform by Mr George B Reeve, who presented Messrs Hobson, Morse, Wainwright and McGuigan. Mr Reeve than spoke as follows:

"Your Royal Highness now stands where your illustrious father, the King, stood on the 25th day of August, 1860, when he drove the last rivet in the Victoria bridge, which was considered at that time one of the wonders of the world."

"The enormous increase in traffic of the country made it necessary in 1897 to reconstruct the bridge, substituting for the single track tubular bridge, the one you see today with double track and double roadway which is known as the Victoria Jubilee Bridge, in honour of Our Most Gracious Majesty, the late Queen."

"Early in the spring when our president, Sir Charles Rivers-Wilson paid his annual visit, he suggested that we should take advantage of the occasion to present a souvenir, which I have a great deal of pleasure in doing, and trust that you will accept it; and before closing, unless Your Royal Highness commands to the contrary, I would desire on behalf of my colleagues and myself, to bid you adieu, expressing their wishes and my own that Her Royal Highness and yourself may have a pleasant voyage across the Atlantic, and a safe landing on the shores of dear old England."

The souvenir presented by Mr Reeve consisted of a beautifully bound book containing a history and description of the bridge with photographs. In accepting it, the Duke spoke of the interest which the occasion had for him, owing to his father's connection with the structure. He also referred in terms of high praise to the arrangements of the Grand Trunk Railway Company for his comfort while travelling over its system. The Duchess showed great interest in the proceedings and was presented with a beautiful basket of roses. A photograph of the royal couple was taken by Mr J. Wesley Swan, official photographer to the Grand Trunk. Their Royal Highnesses then graciously shook hands with all the railway officials present.

After re-entering their car, the Duke and Duchess gave Mr Reeve a handsome silver jewel box and their signed photographs. As the train departed, three hearty cheers were raised, and the Duke and duchess bowed their acknowledgments from the rear of the car.

Montreal Gazette, October 16 and 17, 1901.

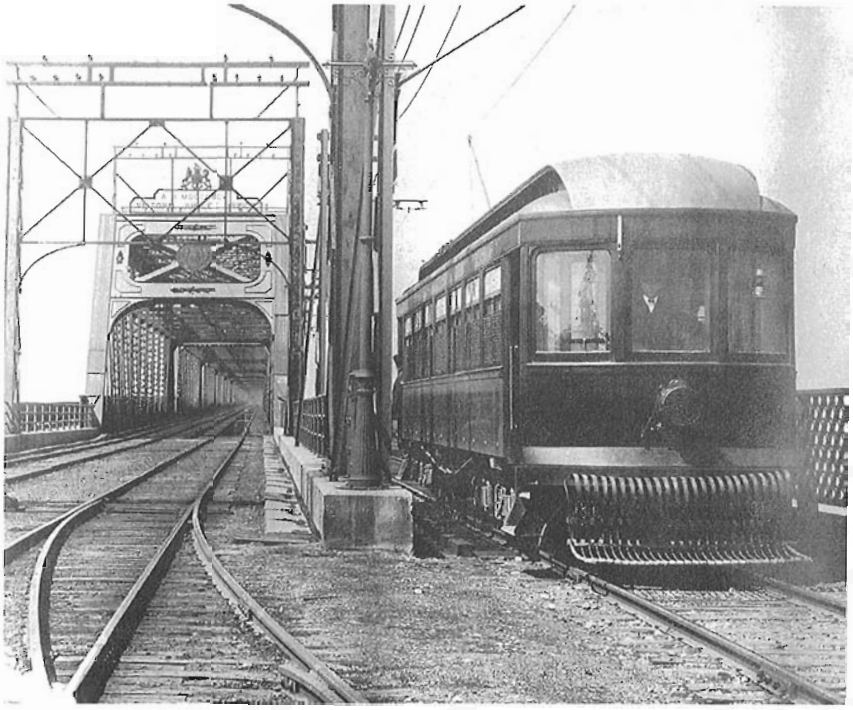
A group of postcards and playing cards, dated between 1905 and 1911, depicting the Victoria Bridge. Of special note is the upper left one which is postmarked Richmond, Quebec, October 11, 1905. The ten of Clubs was from a deck issued by the Intercolonial Railway, while the King of Diamonds was from a Canadian Pacific Railway pack (the only non-CPR scene in the deck).

EPILOGUE

The rebuilding of the Victoria Bridge was a success from the start. The start of full double-track operation on December 13, 1898 meant that the bridge was no longer a bottleneck, and the GTR could operate at full capacity. As a matter of interest, the railway's other big projects continued too, and the last tubular bridge, that at Ste. Anne de Bellevue, was replaced in 1899.

On December 1, 1899 the roadways were opened to through traffic. This was the first time ever that a road vehicle or pedestrian could cross the St. Lawrence without using a boat, or crossing on the ice. From the very start it was a toll bridge, and the first schedule of tolls included such items as tandem bicycles, cattle, sheep and pigs. One wonders what would happen if someone were to drive a herd of sheep on foot across Victoria Bridge today! One item conspicuous by its absence was the automobile. In 1899 there was only one auto in

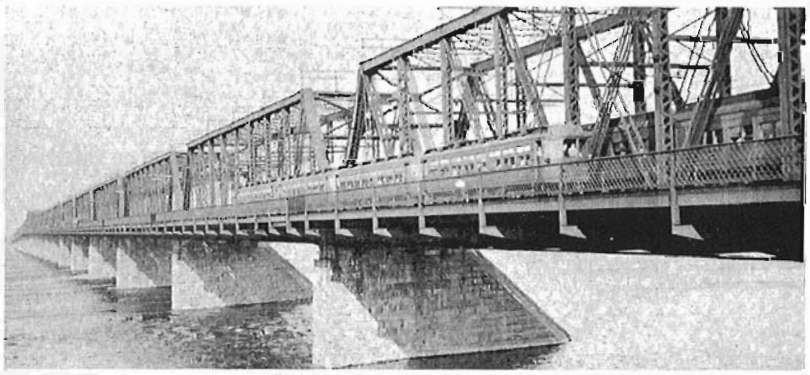
TOLLS ON VICTORIA BRIDGE DECEMBER 1, 1899		
	ONE WAY	RETURN
Pedestrian (6 tickets for 25 cents)	5	—
Horse and rider	15	25
One-horse carriage	20	30
Two-horse carriage	30	50
Three-horse carriage	40	60
Four-horse carriage	50	70
Bicycle and rider	10	15
Tandem bicycle (per passenger)	10	15
Horses or mules (per head)	10	—
Cattle (per head)	10	—
Sheep (per head)	5	—
Pigs (per head)	5	—
Calves (per head)	5	—
One or two-horse wagon (loaded)	40	—
One or two-horse wagon (empty)	20	- -
Three or more-horse wagon (loaded)	75	—
Three or more horse-wagon (empty)	40	—
Automobile	Not even mentioned!	



Montreal & Southern Counties car No. 1 arriving at St. Lambert on its first trip across Victoria Bridge; November 1, 1909.

Montreal, and the GTR obviously did not consider it worthwhile to create a special toll category for it; besides there is no record that Senator Dandurand ever drove his machine over the bridge in the early days. These tolls, with numerous modifications, lasted until the 1960s.

One thing that did not at first work out as planned was the provision of electric cars. This was definitely in the original plan and, in 1897, a company called the Montreal and Southern Counties Railway, affiliated with the Montreal Park & Island Ry., had been formed for this purpose. For various reasons nothing was done and, in 1905, a company called the Montreal and South Shore Autocar Company began to offer a rudimentary bus service across the bridge. This was not very successful and eventually the M&SC was revived and, under Grand Trunk leadership, began running across Victoria Bridge on November 1, 1909. Unlike in the original plan, the electric cars did not use the main line railway tracks, but instead ran on the downstream roadway. Henceforth all vehicular traffic was confined to the upstream roadway, while the downstream side was used only by the M&SC and the pedestrian walkway. Those who complain about the narrow traffic lanes today do not realize that both directions once shared the same side, and this lasted until the rebuilding of the roadways in 1956!



An M&SC train crossing Victoria bridge about 1950. Note the CNR train on the main track behind.

No account of Victoria Bridge would be complete without some mention of the M&SC. This famous interurban operated from 1909 to 1956 and connected Montreal's McGill Street station to places as far away as Granby, reached in 1916. Originally intended to go to Sherbrooke, this never materialized. In 1951 electrification was cut back to Marieville and, early in the morning of June 19, 1955 the last electric car crossed the bridge. For more than a year, the CNR operated a shuttle train

LEFT: Two toll tickets and a token from Victoria Bridge. The one on the extreme left is an eight-trip, with six trips used, for a pedestrian. It was issued in 1921 when the bridge was still owned by the Grand Trunk System. On the immediate left we see both sides of one coupon of a ten-trip pedestrian ticket issued in the 1940s under CNR ownership. Neither of these tickets were good on trains or automobiles, only on the walkway. The token was for the passage of an automobile, and was used from about 1957 until the late 1960s.

from Central station to connect with the M&SC at St. Lambert, but in October 1956 the electric lines were abandoned. This was not quite the end of electrification on Victoria Bridge, for the 2400 volt D.C. electrification of the Central station area extended about halfway across, so electric locomotives did some switching on the bridge. With dieselization, the electric wire was cut back to just south of Central station.

Victoria Bridge from the air, April 10, 1999. The Seaway diversion is plainly visible. Photo by Fred Angus

In 1923, the Grand Trunk was taken over by the Canadian National Railways and, of course, the Victoria Bridge was part of the deal. Under CNR management things continued much as before until the 1950s. Then the plans for the St. Lawrence Seaway called for a lock at St. Lambert, right in the path of Victoria Bridge! Some authorities favoured tearing down the bridge and building an alternate crossing, either a bridge or tunnel, somewhere else. The biggest defender of the existing bridge was Donald Gordon, the President of the CNR. He said, in effect, that no boat was going to block his trains or destroy his bridge. At length a compromise was reached. A diversion was built from St. Lambert which swung west, and then joined the existing bridge about one-third of the way towards Montreal. That way, if a boat was going through the lock, the trains could take the diversion and not be delayed. As a result of this modification, spans 17 and 18 (where the diversion came in) and 24 and 25 (where the lock was built) were torn down, leaving 21 of the original 25 spans standing. The roadways now returned to both sides, and the paving was replaced with an open-work grating which caused strange vibrations to vehicles driven over it. At the same time the pedestrian walkway was abolished.

The "Irish Stone", mentioned on page 63, also had an interesting story. On December 21, 1900 the Grand Trunk, without any warning, picked up the stone with a crane and moved it to a park some distance away. The resulting uproar made the GTR have second thoughts about using the site for a better approach to the bridge, but the stone was not returned until 1911 when a compromise allowed it to be placed only 15 feet from its original location. It was threatened again in 1966 when access roads were being built to Expo 67. This time another compromise resulted in Bridge Street being diverted around the stone, which now sits on an "Island" in the middle of the road, still standing as a memorial to the 6000 Irish who died nearby in 1847 and 1848.

By the 1990s Victoria Bridge was showing its age, and was in need of considerable repair. After all the steelwork was almost 100 years old, and had been exposed to Montreal's harsh climate all that time. Eventually this repair work was done over several years, and on three long weekends in 1995, and again in 1996, all rail traffic was stopped while trains were diverted by a circuitous route, across the CPR bridge several miles away. It is interesting that six 72-hour stoppages were required, whereas in the rebuilding of 1897-1899, the maximum stoppage was only two hours, and the total stoppage being only 20 hours. The roadway was another matter. The CNR rightly claimed that it was operating a railway bridge, and was not responsible for maintaining it for road traffic. For a time heavy trucks and busses were banned, and the railway threatened to close the bridge to all road traffic. Eventually the provincial government came up with the money, and the repairs to the road structure began and are continuing.

So we see that, after 140 years of service, including 100 in its rebuilt form, Victoria Bridge is still very much a part of the Montreal scene. It is still the vital railway link it was intended to be, and is also a major traffic artery as well. Although there are no more pedestrians, or sheep and cattle, crossing it on foot, the automobile traffic is vastly more than was ever planned.

Those who designed and built the Victoria Bridge, both in 1854-1859, and 1897-1899, would be proud to see their project still in vital use as we prepare to enter the new millennium.

NOTICE OF ANNUAL GENERAL MEETING

The Annual General Meeting of the Canadian Railroad Historical Association will be held in Revelstoke, British Columbia on August 28, 1999. At this meeting four directors will be elected to fill the places of four directors whose terms expire this year. The incumbent directors are eligible for reelection. On May 31, 1999 a nominating committee was set up to prepare a slate of four candidates for these positions.

Any member may make nominations for candidates for the Board. To be valid, a nomination must be signed by two members of the C.R.H.A. in good standing, and must also be signed by the candidate, indicating his willingness to serve if elected. All candidates must be regular members in good standing of the C.R.H.A. All nominations must be received by the Secretary, Maurice Gervais, c/o C.R.H.A., 120 Rue St. Pierre, St. Constant, Que. J5A 2G9, before midnight on July 2, 1999.

If there are more than four candidates, an election will be held, and ballots will be distributed by mail.

Maurice Gervais, Secretary. Per Fred F. Angus.

May 31, 1999.

BACK COVER: The Montreal end of the Victoria Jubilee Bridge on December 14, 1899, just thirteen days after the roadways were opened to traffic. At that time both roadways were used for road vehicles, but ten years later, November 1, 1909, the Montreal & Southern Counties electric railway began to use the downstream roadway, so both road lanes had to use the upstream side. In 1899 there was not yet any automobile traffic.
National Archives of Canada, photo No. PA-202524.

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