

of the towers on both sides of the river were preserved, & have place in the new towers. The new stone used in the towers on the New York side came from Buffalo quarries, & that in the Canadian towers from Queenston quarries.

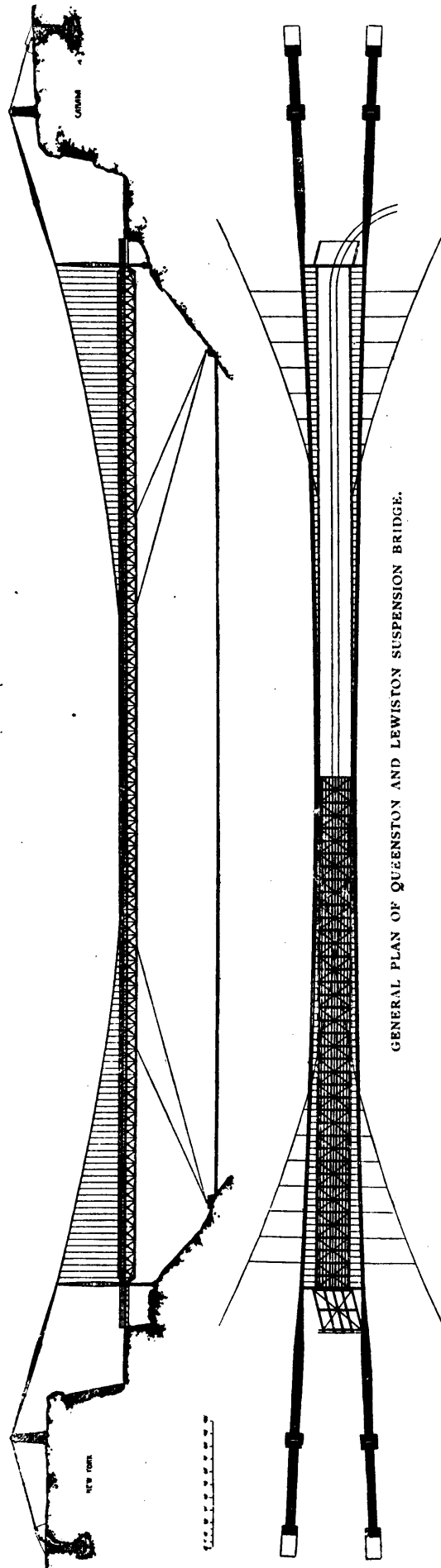
Four cables form the main support of the bridge. Each of these is composed of fourteen $2\frac{1}{4}$ in. galvanized cast steel wire ropes. These cables once formed a part of the old suspension bridge that stood close to the falls, & which was taken down in the early part of last year. The span of the upper suspension bridge was so great, & the anchorages so far back from the towers, that it has been found possible to cut the old cables in half, & thus use them on the shorter span of this new bridge. However, when so cut they are hardly long enough to fill out the entire span & reach back to the anchorages, & for this reason about 75 ft. at each end of the cable span is made up of eye-bars. The cables are anchored in solid rock about 150 ft. back from the towers, the shafts being filled with concrete. The suspended span is connected to the river banks by 2 approach spans, the one on the New York side being 34½ ft. long, & the one on the Canadian side 19½ ft. long.

On each side of the river the bridge has long approaches on which double tracks are laid for electric cars passing on & off the bridge. These approaches are about 25 ft. wide; the one on the Canadian side is about 1,000 ft. long, & the one on the New York side about 800 ft. long. Both approaches have face walls to prevent the native shale disintegrating under the weather. The approach wall on the New York side runs close beside the tracks of the Niagara Gorge R.R. Its highest part is about 19 ft., & for 660 ft. it drops at a 1% grade, & then for 200 ft. at a 2% grade. The high part is laid in cement, & the remainder is laid dry. These approach walls form the bridge landings. Gorge R.R. tracks are connected with the bridge on the New York side, & the Niagara Falls Park & River Ry. tracks with the bridge at the Canadian end. This makes it possible for passengers to travel around the beautiful gorge without leaving their seats in the electric cars. Starting, for instance, from the New York State Reservation, at Niagara Falls, N.Y., the trip consists of crossing the river over the new upper steel arch in a car of the Niagara Falls Park & River road; passing down that line along the top of the high bank on the Canadian side to Queenston, there crossing on the new suspension bridge to the New York side, where the tracks of the Niagara Gorge R.R. are taken back along the water's edge & up the bank to the point of starting, thus allowing passengers to view the river & banks from above & below, all forming a most delightful trip.

The capacity of the new Suspension bridge is such that it will accommodate the heaviest of trolley cars, together with a uniformly distributed load of 40 lbs. to the square foot over the entire structure. About 800 tons of metal have been used in its construction, & the cables weigh about 200 tons.

Canadian Enterprise in Brazil.

Comparatively few northern people know that in the southern part of Brazil lies one of the richest & most rapidly growing cities of South America, the capital of the state of Sao Paulo, & most advantageously situated as regards climate, elevation, railway connections & seaport facilities. The city of Sao Paulo is situated about 40 miles from the seacoast, directly under the tropic of Capricorn, $23\frac{1}{4}$ degrees south of the Equator. About 5 miles from the ocean hills rise abruptly to the height of 2,000 ft., & from this point a tableland extends inland for many miles. Sao Paulo is one of the highest points on this table land, its eleva-



tion being 2,500 ft. above the sea level. The climate is, for a tropical country, cool, bracing & healthful, & is not characterized by that depressing tropical humidity which is felt in the seacoast cities of Brazil. The latest estimates place the population at not less than 250,000, the growth having been extremely rapid during the past ten years. It is to this city that the attention of a number of Canadian & New York capitalists has been directed for some time, with the result that a syndicate has been formed, consisting of F. S. Pearson, Chief Engineer of the Metropolitan Street Ry. Co. of New York; W. Mackenzie, who is largely interested in many Canadian street railway properties; B. F. Pearson, of Halifax, N.S., & others, to develop the street railway, light & power interests of Sao Paulo. Franchises have been obtained for street railway lines covering all desirable routes in the city, including a few miles of street now traversed by a mule railway which has been in existence for some years. R. C. Brown, whose management of the Halifax property was such as to win him the entire confidence of its owners, has gone to Sao Paulo with a large consignment of electric railway apparatus, & is in full charge of construction, equipment & temporarily, of the operation of the system. He is accompanied by F. S. Pearson, who will determine the main outlines of the installation, locate power stations, etc.

The syndicate has obtained a concession for a number of lines laid out in such a way as to give the whole city a good service, but it is not believed that the development of the system will stop with the completion of these lines, for there are desirable suburbs to be reached. Coal in Sao Paulo sells for \$10 a ton, & wood is equally costly. As a consequence, the price of gas & electric lighting is high, & none of the city lighting is as yet done by electricity. Five thousand commercial incandescent lamps are, however, supplied from the present station. The electric light service begins at sundown & except for a few large customers, extends only until 10 o'clock in the evening. About 20 miles west of the city of Sao Paulo is the only large water power near the city, with a profitable minimum supply of 10,000 h.p., to 20,000 h.p. This has been secured by the syndicate, which intends developing power & transmitting it to Sao Paulo for furnishing the lighting, railway & power service. The introduction of cheap power into a city where steam power at present costs from \$100 to \$150 a year will mean a great deal to its industries & to the lighting & railway enterprise. The right to build a transmission line has been obtained & this line will pass through the town of Augua Branca, where there are at present several factories.

The syndicate has obtained the government approval for a type of street car which is almost an exact duplicate of the Broadway, New York, car. At present there has been shipped to Sao Paulo 10 miles of track, with necessary ties & other railway iron; 15 cars, Broadway pattern; two 225 kw. generators for direct connection with the engines & boilers. By the end of the year it is expected that 35 miles of track & 75 cars will be in Sao Paulo, & within a short time thereafter the temporary steam power station, now building, with apparatus described above, will be re-