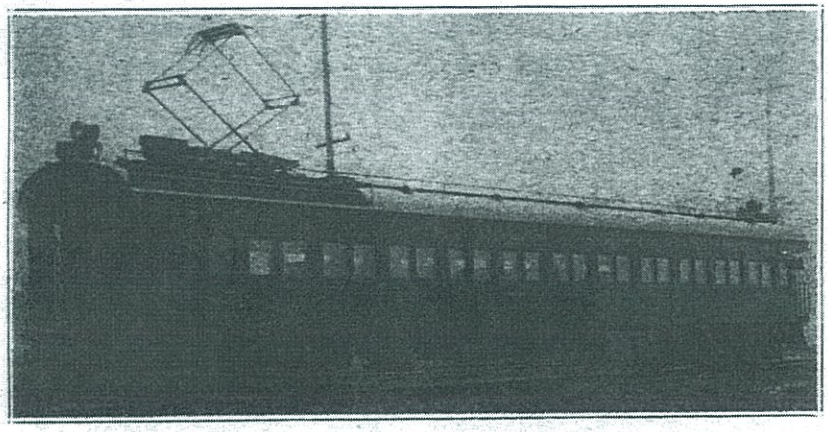
CNR ELECTRIC MULTIPLE UNIT CARS

Multiple Unit Cars, Montreal Electrified Zone, Canadian National Railway.

As stated in Canadian Railway and Marine World previously, the Canadian National Ry. has extended the Montreal electrified zone from Lazard to St. Eustache sur le Lac, 9.8 miles, on the L'Orignal Subdivision, Montreal Division, Quebec District, and as also stated, two multiple unit cars, 15,903 and 15,904, were obtained from the company's Point St. Charles shops, Montreal, for operation in the zone. These cars were converted from standard wood first class cars by reinforcing the floor system of the bodies to carry the heavy electrical equipment, changing the roof from the monitor type of the standard steam passenger cars to the turtle back type, with its less weight and lower vertical clearance, building and applying new motor type trucks, and installing the motor and control equipment.

Both cars are 80¾ ft. long over buffers, 10 ft. 1 in. wide over mouldings, 9¾ ft. wide over side sills, and 9 ft. wide inside between posts. The maximum height is 25 ft. 10 in., operating height over all, 24 ft. 10 in., height overall with



Multiple Unit Car, Montreal Electrified Zone, Canadian National Railway.

feeder equipment collapsed 15½ ft.; height, rail to top of roof, 13 ft., and to top of headlight case, 15 ft. 0 7/16 in. In size they equal the C.N.R. first class passenger cars. The truck wheelbase is 5½ ft., and truck centers are 56 2/3 ft. Car 15,903 weighs 164,060 lb., and 15,904 weighs 164,420 lb.

The underframes are of the standard wooden type, reinforced with 6 x 4 x ½ in. angle and 6 x ⅝ in. steel plate extending the full length of the sills. The crossbearers are of 7 in. steel bulb beam, and the bolsters are built up of 1¼ x 8 in. material. The superstructure is wooden throughout, the main posts being of 4½ x 2 in. ash, the side plate and belt rail of hard pine, and the carlines of 1½ in. ash.

The cars are lighted by a standard 32 volt system, and a row of shaded fixtures is installed down the center line of the ceiling, spaced about 6 ft. apart. The interior is divided into main and smoking compartments, and lavatory facilities are provided.

The electrical equipment consists of 4 G.E. 239 motors mounted one for each axle, and connected thereto by a 17 to 73 pinion and gear. The motors are rated at 140 h.p. at 1,200 volts and are connected two in permanent series across the 2,400 volt control. The control is G.E. type M, arranged for multiple unit operation and includes a type C 108A master controller at each end, a magnetic contactor group for the motor control; an electro-pneumatic reverser, resistance grids and a control motor generator set. This motor generator set consists of a motor having 2 independent 1,200 volt armature windings connected in permanent series for operation on the 2,400 volts, and a 600 volt generator. The 2 armatures are mounted on a common shaft, and the motor and generator fields are assembled in the same frame. The generator has a capacity of 6 k.w. at 1,400 r.p.m. The voltage regulation and overload protection is secured by a G.E. no. 51 regulator panel mounted in the driver's compartment. The air supply for brakes, pantagraph, pneumatic valves, etc., is provided by a G.E. type 27 C.P. compressor, driven by a 600 volt motor, and controlled by a type G.K. 9 automatic governor, designed to operate between 85 and 95 lb. air pressure.

Special equipment includes: Westinghouse air brakes, with clasp brakes, Westinghouse air signal equipment, forged steel axles, with 5½ x 10 in. journals, National centering device, Agasote headlining, Gold hot water heating system, Salamander insulation, McCord journal boxes, Miner roller bearings, 4-wheel equalizer type trucks, with 36 in. rolled steel wheels, Simplex truck locking device, Adanac exhaust ventilators, 4 fire extinguishers, 2 Strombos horns and 1 bell. The floor is in 2 courses, with Neponset paper between, the lower course being pine, laid diagonally, and the upper B.C. fir, laid longitudinally. The interior is finished in mahogany, the seats in the main compartment are upholstered in green plush, and those in the smoking compartment in leather. The cars were placed in operation in June, one running between Montreal tunnel terminal and St. Eustache, and the other between the tunnel terminal and Cartierville.

As stated previously, the recently-completed electrified section from Lazard to St. Eustache is an extension of the Montreal tunnel 2,400 volt d.c. system, but is of the inclined catenary type of overhead construction, which was described and illustrated in Canadian Railway and Marine World for June, pg. 297. Structural steel poles are spaced from 330 ft. on tangent track to 240 ft. on curves. They are designed with a standard vertical member to which can be attached for single track, a standard type C structural arm, a short type C.A. arm, or it can be used as an armless pole for curves or anchors. On 2 or 3 track sections, 2 of these can be made into a bridge span by the addition of a horizontal member. The messenger is 477,000 c.m. steel reinforced aluminum cable, to which is attached a standard 4/0 grooved copper trolley, the combined conductivity of the system being equivalent to 511,600 C.M. of copper. No feeders are used at present. The fittings were designed specially by Ohio Brass Co. for this type of construction and the whole overhead structure has been designed to withstand the stresses due to the long span, in addition to ice and wind loadings, with an ample factor of safety.

This installation permits the use of electrical car equipment which was obtained from the General Electric Co. by the Canadian Northern Tunnel Co. some years ago, and considerably improves the utilization factor of the sub-station equipment at the tunnel. The use of these cars, which have power to operate one or 2 trailers, enables the withdrawal of an electric locomotive on the Cartierville run and of a storage battery car on the St. Eustache run, and establishes a considerably increased capacity to take care of the growing traffic in that territory without any additional capital expenditure.

Canadian Railway and Marine World is indebted to R. G. Gage, Electrical Engineer, C.N.R., Montreal, for the information used in this article.

Grand Falls, N.B., Power Development Plans.

The New Brunswick Electric Power Commission was authorized, under an amendment to the New Brunswick Electric Power Act, passed by the New Brunswick Legislature, to expend approximately $9,000,000 for further hydro-electric development, with a general understanding that this amount would be applied to the development of the Grand Falls of the St. John River. The amending act also provided for increasing the number of the commission to not more than 7, of whom 2 may, or may not, be members of the Provincial Government, and 3 of whom shall form the executive commission. The members of the commission, except members of the Government, hold office for 5 years. The commission at present consists of Hon. E. A. Smith, Shediac, N.B., Chairman; and Hon. J. E. Michaud, Edmundston, N.B., commissioner, with Miss A. R. Carter, St. John, as Secretary, and S. R. Weston, St. John, as Chief Engineer. An order in council was passed recently by the New Brunswick Government, authorizing the Commission to go ahead with the work. Tenders were received to July 18 for building about a mile of railway to the site of the development work, and to July 30 for the construction of works included in the main contract for the development, for which H. G. Acres, of the Hydro Electric Power Commission of Ontario, is consulting engineer. We are advised that the piece of railway to be built will start from the Canadian Pacific Ry., about a mile below Grand Falls, and extend to the power house of the development. It will be used for delivering supplies, machinery and equipment to the power house during the construction period, and will be maintained after the plant is in operation.