

Canadian Railway and Marine World

March, 1916.

Passenger Cars for Transcontinental Service on Canadian Northern Railway.

For the inauguration of transcontinental train service on the Canadian Northern, it was found advisable to provide 77 new cars of the latest and most substantial construction, the various types being illustrated by the accompanying plans and divided as follows: 15 baggage-express, 4 postal, 5 second class, 12 first class, 7 colonist sleeping, 7 tourist sleeping, 7 dining, 11 standard sleeping, 2 compartment sleeping and 7 compartment-buffet observation sleeping, all of which were built from the railway company's designs and specifications by the following builders: National Steel Car Co., Hamilton, Ont., Crossen Car Co., Cobourg, Ont., Preston Car and Coach Co., Preston, Ont., and Canadian Car and Foundry Co., at its Amherst, N. S. and Turcot, Que. works.

The body framing throughout is of ample proportions to withstand an assumed buffing shock of 500,000 lbs. with a large factor for safety, the side construction is self-supporting and thoroughly reinforced for window and side door openings. The two body bolsters are of unit builtup form, having suitable cover plates top and bottom, 24 in. wide at the centre, tapering to 15 in. in width at the ends. The centre sills form a box girder with cover plates 23 in. in width, extending from end to end of cars, so far as possible, the principal members being two rolled steel 15 in. by 33 lb. channels placed back to back and provided with a finished camber at the centre of car of $\frac{3}{4}$ in. when car is ready for service. The vestibules are built entirely of steel, so formed as to constitute separate members each side of centre construction, this being an important item in case of damage admitting of making repairs more easily and also should one corner be swept away there is no liability to distort or disarrange the adjacent end panel on other side of car. The platform buffers are of coil spring design with coupler centring device, furnished by the Standard Coupler Company, of New York, which provides a maximum cushioning effect of 84,000 lbs. per car, which added to that of the A-2-P draft gear allows for a maximum buffing resistance of 387,000 lbs. before the centre construction is directly effected. The top diaphragm buffing attachment is designed to accommodate the railway company's standard coil springs of $\frac{1}{4}$ in. square crucible steel. The steel end posts extend down in front of the pressed steel end sills and are reinforced by cover plates and connection angles, all forming a rigid panel strong enough to cause the side and centre construction to work in union under direct impact.

General conditions both from the standpoint of maintenance and operation necessitated the use of a steel car insulated inside and outside with wood. The light weight of the cars has been kept down so far as possible, but inevitably a composite construction does not lend itself to the greatest refinement in this respect, and on account of the long journeys a large storage battery capacity

necessitates two sets of batteries being carried, besides considerable other equipment, such as overhead water storage tanks, in conjunction with the usual air pressure water raising system under car.

The lighting equipment conforms to the railway company's standard practice as followed for equipment built in the past, with the exception that the steel conduit for wiring is entirely removed from the roof, and inspection is obtained from special junction boxes with weather-proof covers extending through the roof, the conduit proper passing between the roofboards and the headlining. The annunciator wiring is also executed in conduit. Current is supplied to the lamps and fans by dynamos for all cars, double batteries of 500 ampere hours capacity being furnished except in the case of the baggage cars and colonist sleepers, which have a single set of batteries of 240 ampere hours capacity. The Safety Car Heating and Lighting Co's fixtures are provided and especially designed, metal-cased, slate switchboards are provided for the sleeping and dining cars; these cars are also furnished with electric exhaust fan sets, having a capacity of 400 cub. ft. of air per hour. Fifteen watt, 12 candle power lamps are furnished throughout and 10 in. non-oscillating electric fans with takedown attachment are used. Candle lamps are used for auxiliary lighting purposes. Hot water circulation heating system is used on all cars, except the baggage and postal cars, which are fitted with straight steam equipment in conjunction with stove auxiliary. Composition flooring, laid on sectional galvanized steel, is provided on all cars and so formed as to provide sanitary corners for all outside edges. The baggages and postal cars have sheathed ceilings, the remaining cars being furnished with canvas with gold leaf and dutch metal to the railway company's standard patterns. The end construction throughout is designed to meet primarily the United States standard specifications for mail cars, this being considered a satisfactory basis.

For the baggage cars, the railway company's standard practice was not altered from the equipment of that class purchased previously. Arrangement was made, however, to carry two sets of desks and filing cases, also sleeping accommodation and a vault. Auxiliary lighting equipment for passenger cars is carried in a sealed box located in the centre portion of the car, there being 24 candle lamps and a double set of candles furnished. Emergency wrecking tool cases and auxiliary outfit, also a thaw-out hose 50 ft. long, designed to connect directly to a thawout connection on train line of each car, are maintained in sealed cases on baggage cars. A steam-water mixer is attached to the basin water supply, to heat the water as desired during the winter.

On account of operating for a short distance and being obliged to maintain local mail service through United States territory and for the reason that the

type of car standardized by the U. S. Post Office Department has been satisfactory to all concerned, it was adopted for the cars built recently. Several novel features were embodied in the design, chiefly on account of restrictions from following usual standard practice for this class of equipment. No gas auxiliary lighting was provided, this necessitated the use of a 350 watt electric coffee heater. Double windows, besides storm sashes, for service in winter had to be furnished and therefore a novel scheme of drop sash fixtures had to be devised so as to allow the upper or screened section of top sash to operate as intended. Weather conditions necessitated the use of condensation collectors for skylight over letter cases, and extreme care was exercised in designing the glass fastening frame, which is of sheet copper, to avoid any leakage, which might become serious on account of the possible collection of large quantities of snow and ice. The wiring was carried out entirely in steel conduit and the train line connected so as to draw current as desired from any car in the train. The light distribution is in exact accordance with the latest recommendations for postal cars and 15 watt lamps were installed throughout. Large overhead tanks are provided and furnished with water level gauges, and hot water attachments were included for basins. The sides and ends of car are painted a light grey, while the ceiling is of a lighter shade.

Second class cars are now being generally superseded by colonist sleeping cars for transcontinental train service, but the type of second class car shown in the accompanying plan, is especially well adapted for local business, or through service, where a maximum number of passengers have to be carried. The maintenance cost on a car of this style is considerably less than that of a colonist sleeper, principally because of the absence of bunks and kitchen, the latter being unnecessary for harvester excursions, where men form the great majority of the passengers, as they purchase sardines, crackers and sandwiches from news agents; besides this a second class car weighs about 7 per cent. less than a colonist sleeper. A large water capacity and plenty of ventilation is essential to the proper operation of a car of this class. Square deck and side finish, all in natural birch, was used in conjunction with low back reversible seats upholstered in pantasote.

The railway company's usual design of first class car was used, except that slight modification obtained with respect to the style of smoking room employed. High back reversible seats were installed and upholstered in green plush for main room, while the smoking room sofas were covered with pantasote. Empire deck with oval oak sashes and square outside gothics fitted with clear pressed prism glass, was employed, the finish throughout being of plain mahogany, relieved with three line striping and single white holly striping for curtain boxes.