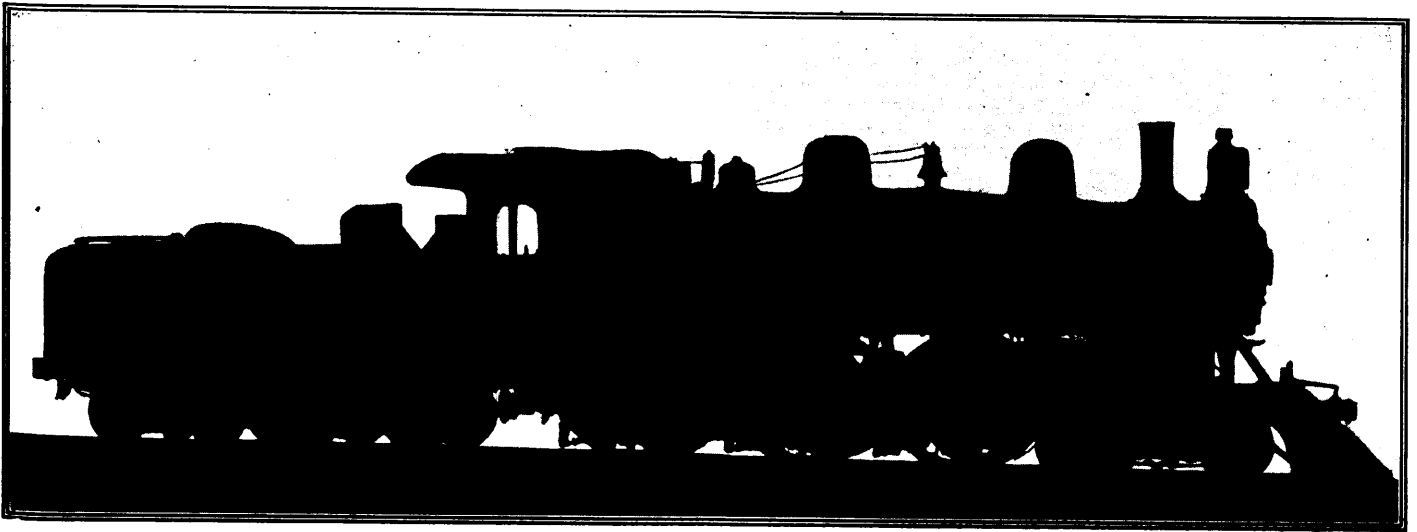




C.P.R. Compound Passenger Locomotives.

The C.P.R. has recently had built at the Schenectady works of the American Locomotive Co. three 10-wheel compound passenger locomotives, of which four illustrations are given on this page and page 377. These locomotives have strikingly graceful lines, the curve contour of the cab and tender being especially noticeable, as something unusual in locomotive lines in general.

The locomotives are designed to burn bituminous coal and to operate at a working boiler pressure of 210 lbs. per sq. in.; having a total weight of 168,000 lbs., 44,000 lbs. of which is carried by the truck wheels, and 124,000 lbs. resting on driving wheels, and available for adhesion. The driving wheel centers are constructed of cast steel with Krupp crucible steel tires, having an outside diameter of 69 ins. The high and low pressure cylinders are respectively 22 and 35 ins. in diameter, with a 26-in. piston stroke. From the above details it is seen that the locomotive exerts a maximum tractive power of 25,000 lbs. and the adhesive ratio, 4.86. The total wheel base of the locomotive is 25 ft. 11 ins., driving wheel base 14 ft. 10 ins., and the total wheel base of locomotive and tender is 54 ft. 2½ ins. The length over all of the locomotive is 42 ft. 1½ ins., and the locomotive and tender 64 ft. 11½ ins. The height of the center of boiler above the rails is 8 ft. 6¼ in., and the distance from top of rail to top of stack is 14 ft. 6 ins. The driving-box

material is cast steel, the diameter and length of driving journals being 9x12 ins. The main crank-pin journals are 7 ins. in diameter by 6½ ins. long, the main side rod crank-pin journal being 7½ ins. by 4¾, and the front and back journals 5 ins. in diameter and 4½ ins. in length. The engine truck is of the 4-wheel swing bolster type, with 30-in. wheels having cast-iron spoke centers fitted with Krupp steel tires, the journals being 6 ins. in diameter by 10 ins. long. The horizontal thickness of high-pressure piston is 5¾ ins., and of the low-pressure 4½ ins., the diameter of the piston rods being 3¾ ins. The main rod is 10 ft. 5 ins. long from center to center. The valves are of the piston type on both high and low pressure cylinders, having 6 ins. travel and an outside lap on the high-pressure side of 1¼ ins., and on the low-pressure side of 1 in. The inside clearance of the high-pressure cylinder is ½ in., and the low-pressure cylinder ¾ in., the valves being set line-and-line and in full gear.

The boiler is of the extended wagon-top type with radially stayed crown sheet, the three front rows consisting of expansion stays 14 in each row, and back head and front flue sheet being braced with rod braces. The material of the barrel and outside of firebox is steel, the outside diameter of the first ring being 62½ ins., and the thickness of material in barrel and outside of firebox ½ in. and ¾ in. The horizontal seams are butt joints, sextuple riveted, with inside and outside welt strips. The circumferential seams are double riveted lap joints. The firebox is set over the frame

and is 108 3-16 ins. long by 41½ ins. wide, the consequent grate area being 33.6 sq. ft. The depth of the firebox in front is 71½ ins., and at the back 64½ ins. The steel plates entering into its construction have the following thicknesses:—Side, back and crown sheets, ¾ in.; tube sheet, ½ in. The water space in front is 4½ ins. and 5 ins., on the sides 3½ and 4 ins., and at the back 3½ and 4½ ins. The crown stays are 1½ ins. in diameter, and the remaining staybolts 1 in. in diameter. There are 312 charcoal iron tubes no. 11, B. W.G., 2 ins. outside diameter and 14 ft. long over flue sheets. The tubes furnish 2,273.3 sq. ft. of heating surface, and the fire-box 171.96 sq. ft., the total heating surface being 2,445.26 sq. ft. This establishes a ratio of 1 sq. ft. of total heating surface for each 50.7 lbs. of weight on drivers. The grate is of the rocking type with plain ash-pan having dampers in front and behind. The exhaust pipe is of the single type, furnished with nozzles 5¼, 5½ and 5¾ ins. in diameter. The distance of tip above center of boiler is ¼ in. The smoke-box diameter is 65½ ins. outside, and its length 73¾ ins., containing netting composed of no. 11 steel wire with 2½ x 2½ mesh. The stack is of cast-iron 14 ins. in diameter, and the height of the top of stack above smoke-box is 3 ft. 3 ins.

The tender conforms in graceful outline to the general lines of the locomotive, and is of the C.P.R. standard hopper-tank type. The tank capacity is 5,000 imperial gallons, and the coal capacity of the tender is 10 tons. The tank is constructed of steel plate, the

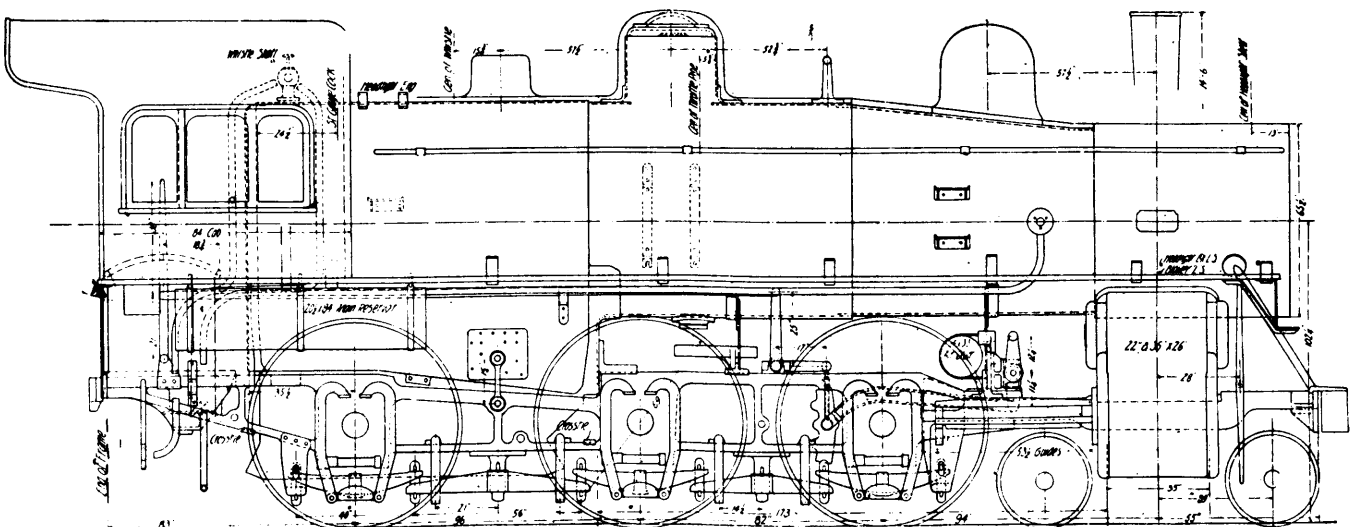


FIG. 2—SIDE ELEVATION, CANADIAN PACIFIC COMPOUND PASSENGER LOCOMOTIVE.