Drilling.—Bolt holes one inch in diameter shall be drilled through the web at 2 11-32 inches from the bottom of the flange. The centre of the first hole shall be 2½ inches from the end of the rail, and the centre of the second hole shall be 6½ inches from the centre of the first hole. These holes must be drilled accurately in every respect; all burrs to be removed. (See plan R-12-28, dated 22nd January, 1908.)

Branding.—The weight per yard of rail, name of maker, month and year of manufacture, shall be rolled on the web of each rail in plain letters and figures, not less than ⅞ inch high and in sufficient relief for future identification. The heat numbers shall be stencilled three times on the web of each rail in distinct letters at least 9-16 inches high, placed on the opposite side from the brand marks. A letter shall be stamped on the heat number side of the web of each rail, clear of the angle bars, to indicate the portion of the ingot from which it was rolled.

Composition.—The rail in composition must be hard, sound and tough, showing fine, dense, grained metal on fracture. The carbon shall average not less than .60 per cent., within limits of .56 per cent. to .66 per cent. The phosphorus shall not exceed .06 per cent. The sulphur shall not exceed .055 per cent. The silicon shall not exceed .18 per cent., nor less than .075 per cent. The manganese shall not exceed 1.00 per cent., nor less than .80 per cent. The sum of sulphur plus copper plus other injurious elements not more than .075 per cent.

Heat Treatment.—The number of passes and speed of train shall be so regulated that, on leaving the rolls at the final pass the temperature of the rail will not exceed that which requires a shrinkage allowance at the hot saw of 6¼ inches for 33 ft. rails, and no artificial means of cooling shall be used between the final pass and the hot saw.

Tests.—While the heat is being cast two test-ingots shall be made; the first from steel going into the first regular ingot, the other from metal taken from the last one.

From each of these test-ingots a chemical analysis shall be made.

These and all final analyses made by the works, relating to this contract, shall be furnished this Railway Company for its records.

Drop Tests.—From each 50 ton heat three rail butts shall be tested. Each butt must not exceed six feet in length, and must be taken from the top end of the first, middle and last ingots cast of each heat.

These butts shall be placed heads upwards on solid steel or iron supports, the distance apart of which in the clear, shall be four feet, and upon it shall be dropped a weight of 2,000 pounds (whose striking face shall have a radius of not more than five inches) falling freely from a clear height of twenty feet. Should two of the tests stand and show a deflection of less than 3¼ inches under such test, this heat shall be accepted. If two fail, it shall be rejected.

The anvil blocks shall weigh at least 20,000 pounds, and the supports shall be a part of or firmly secured to the anvil.

Butts shall be tested to destruction as requested by the inspector.

Treatment of Ingots, etc.—After the ingots are cast they shall be either constantly kept in an upright position until ready to be rolled, or else be so maintained until the interior steel has had time to solidify.

No "bled" ingots or ingots from "chilled" heats shall be used in the manufacture of rails under this contract.

No ingots from badly-teemed heats shall be used.

Cutting of Blooms.—After cutting off or allowing for the "sand" or top-end of each ingot, at least 12 inches more of seemingly solid steel shall be cut off that end of the bloom—a greater length than 12 inches being preferred; and if, after cutting such length, the steel does not look solid, the cutting shall continue until it does.

Heating.—Care shall be taken to avoid overheating the steel, and under no circumstances shall a "cinder" heat be allowed—that is, a heat high enough to cause the cinder to run off the steel as it is being drawn from the furnace. This does not apply to cinder which may be sticking to the underside of the steel when drawn from a horizontal furnace, or to the bottom of an ingot when drawn from a soaking-pit.

Inspection.—Inspectors representing the purchaser shall have free entry to the works of the maker at all times while this contract is being filled, and shall have all reasonable facilities afforded to satisfy them that the rails are being made in accordance with these specifications. The makers shall furnish them with the carbon-determinations of each heat, and a sufficient number of complete analyses to represent the average steel of each day and night's turn. The drillings to be taken from the test ingots. (See Section 10.) On request borings for check analyses shall be furnished the inspector by the manufacturer.

The inspectors shall have authority to reject rails made from insufficiently sheared blooms, or from heats, the test pieces or drop-tests of which have failed, or from badly-poured heats, or from "chilled" heats, or from "bled" ingots. The rails made from insufficiently cut blooms, if otherwise perfect, to be afterwards received as short rails, if sufficient lengths have been sawed off to make an amount of steel equal to the original demand of 12 inches. By a badly-poured heat is meant one which from any cause has been teemed without the control of the operator. A "chilled" heat is one which by reason of the chilling of the steel has to be either pricked or poured over the top of the ladle. A "bled" ingot is one from the centre of which the liquid steel has been permitted to escape.

Imperfectly drilled, straightened (except "lumpy" rails), or chipped or filed rails shall be rejected, but will be accepted after being properly finished.

Rails failing to comply with Section 1 will be rejected.

Handling and Loading on Cars and Vessels.—All rails must be loaded in the presence of the inspector. Rails must be handled during manufacture, loading and while in transit in such a manner as not to bruise the flanges or cause other injury.

ORDERS OF THE RAILWAY COMMISSIONERS OF CANADA.

Copies of these orders may be secured from the Canadian Engineer for a small fee

4620—April 15—Authorizing the Chatham, Wallaceburg & Lake Erie Railway Company to cross, by means of an undercrossing, the tracks of the Michigan Central Railway on the west side of the Town Line Road, near Charing Cross Station, Ontario.

4621—April 15—Authorizing the C.P.R. to construct an extra track across the road allowance at mile 4.9 of its main line, Fort William Section, district of Thunder Bay, Ont.

4622—April 15—Authorizing the C.P.R. to construct an extra track across the road allowance at mile eight (8) of its main line, near Neebing, Fort William Section, in the district of Thunder Bay, Ont.

4623—April 15—Authorizing the C.P.R. to construct an extra track across the road allowance at mile 17.3 of its main line, Fort William Section, district of Thunder Bay, Ont.

4624—April 15—Authorizing the C.P.R. to construct an extra track across the road allowance at mile 14.5 of its main line, Fort William Section, district of Thunder Bay, Ont.

4625—April 15—Authorizing the C.P.R. to construct an extra track across the road allowance at miles 3.6, and 4 of its main line, Fort William Section, district of Thunder Bay, Ont.

4626—April 15.—Authorizing the C.P.R. to construct two extra tracks across the road allowance at mile 13.4 of its main line, at Murillo, Fort William Section, district of Thunder Bay, Ont.

4627—April 14—Authorizing the C.P.R. to construct an extra track across the road allowance at mile 18.25 of its main line, Kakabeka, Fort William Section, Ontario.

4628—April 16—Authorizing the C.P.R. to construct a spur to and into the premises of R. Watson & Company, Toronto, Ontario.