

29497

THE
Railway and Marine World

DEVOTED TO STEAM AND ELECTRIC RAILWAY, MARINE,
GRAIN ELEVATOR, EXPRESS, TELEGRAPH AND
CONTRACTORS' INTERESTS

GENERAL INDEX

FOR 1910



ACTON BURROWS LIMITED, PUBLISHERS
70 BOND STREET, TORONTO, CANADA

STEAM RAILWAY AND GENERAL MATTER

<p>A</p> <p>Acadia Coal Co. 725, 769</p> <p>Advertisers, Index to 41, 123, 207, 291, 377, 469, 563, 655, 753, 845, 941, 1037</p> <p>Ainslie Mining & Ry. Co. 769</p> <p>Albert & Moncton Ry. 547</p> <p>Albert Ry. 545</p> <p>Alberta and Bow Island Ry. 271</p> <p>Alberta and British Columbia Ry. 271, 433, 447</p> <p>Alberta and Great Waterways Ry.— Development . . . 53, 99, 349, 627, 725, 825, 909, 957</p> <p>Finance, Meetings, etc. 53</p> <p>Alberta and Saskatchewan Central Ry. 271, 397, 909</p> <p>Alberta and Saskatchewan Ry. 369</p> <p>Alberta Central Ry. . . . 301, 349, 447, 473, 725, 825, 909, 1013</p> <p>Alberta, Northern, Transportation in . . . 631</p> <p>Alberta North-Western Ry. 1013</p> <p>Alberta, Peace River and Eastern Ry. 271, 433, 447, 547</p> <p>Alberta Ry. and Irrigation Co.— Development . . . 19, 51, 141, 185, 909</p> <p>Finance, Meetings, etc. 47, 117, 205, 287, 375, 489, 545, 645, 769, 853, 947, 1046</p> <p>Statistics . . . 103, 177, 361</p> <p>Alberta Southern Ry. 103</p> <p>Alexander Gibson Ry. and Mfg. Co. . . 645, 947, 1045</p> <p>Alma Central and Hudson Bay Ry.— Appointments . . . 579, 863, 1053</p> <p>Development . . . 19, 109, 185, 349, 373, 447, 457, 547, 627, 825, 853, 909, 947, 1013</p> <p>Finance, Meetings, etc. 1045</p> <p>Report . . . 625</p> <p>Statistics . . . 103, 177, 361</p> <p>American Association of General Passenger and Ticket Agents . . . 283</p> <p>American Express Co. 675, 771</p> <p>American Railway Master Mechanics Association . . . 29</p> <p>Anglo-American Telegraph Co. . . 223, 741, 869</p> <p>Anglo-Newfoundland Development Co.— Appointments . . . 219</p> <p>Development . . . 109, 185</p> <p>Rolling stock . . . 45, 297</p> <p>Appointments, Transportation. . . 49, 139, 219, 301, 385, 491, 579, 671, 863, 955, 1053</p> <p>Apprentice System, G.T.R. *435</p> <p>Apprentices, Some thoughts on training. . . 893</p> <p>Arnprior and Pontiac Ry. 349, 749</p> <p>Arrowhead and Kootenay Ry. 479</p> <p>Athabasca Northern Ry. 1013</p> <p>Athabasca Ry. 349</p> <p>Atlantic and Lake Superior Ry. . . 47, 103, 177, 361, 769, 1045</p> <p>Atlantic, Quebec and Western Ry.— Development . . . 19, 109, 271, 447, 457, 725, 909, 1027</p> <p>Finance, Meetings, etc. . . 217, 489, 545, 937, 1049</p> <p>Statistics . . . 103, 177, 361</p> <p>Attwood, W. S.—Steel Freight Cars. . . 1</p>	<p>Tell-tales for Bridges, Tunnels, etc. . . 723</p> <p>Traffic Orders . . . 47, 101, 195, 299, 369, 493, 535, 639, 745, 835, 917, 947, 1017</p> <p>Weeds on Railway Right of Way . . . 771</p> <p>Weighing Coal in Ontario . . . 89</p> <p>White Pass and Yukon Ry. Rates . . . 861</p> <p>Wooden Trestles, Protection of . . . 803</p> <p>Boiler Tubes, C.P.R., Repairing . . . *907</p> <p>Book Reviews . . . 13, 223, 281, 299, 339, 359, 379, 407, 525, 545, 569, 595, 617, 723, 797, 863, 969, 1035, 1041</p> <p>Boston and Albany Rd. 219, 491</p> <p>Boston and Maine Rd. 863</p> <p>Bow River Collieries Ry. 271, 909</p> <p>Bracebridge and Trading Lake Ry. . . 447, 457</p> <p>Brake Power, Should the, on Freight Cars, be Increased . . . 705</p> <p>Brandon, Saskatchewan and Hudson's Bay Ry.— Development . . . 211, 275, 361, 433, 1047</p> <p>Statistics . . . 103, 177, 361</p> <p>Brandon Transfer Ry. 287</p> <p>Breithaupt, W. H.—Grade Separation. . . 333</p> <p>Bridges, Tunnels, etc., Tell-tales for . . . 723</p> <p>British Columbia and Alaska Ry. . . 185, 299, 349, 547, 627, 725, 825, 909, 1027</p> <p>British Columbia and Dawson Ry. . . 909</p> <p>British Columbia and Manitoba Ry. 19, 109, 349</p> <p>British Columbia and White River Ry. . 1013</p> <p>British Columbia Central Ry. . . 185, 299, 349</p> <p>British Columbia Express Co. 961</p> <p>British Columbia Mainland and Coast Industrial Co. . . . 185, 299, 349</p> <p>British Columbia Southern Ry. 935</p> <p>British Investments in Canada . . . 483, 767</p> <p>British Yukon Ry. 103, 177, 361</p> <p>Brockville, Westport and Northwestern Ry. 103, 177, 361, 581, 653, 1029</p> <p>Bruce Mines and Algoma Ry. . . 103, 109, 185, 271, 281</p> <p>Buctouche Ry. and Transportation Co. . 141, 271, 447</p> <p>Buffalo and Fort Erie Ferry Ry. 281</p> <p>Buffalo and Lake Huron Ry. 211, 853</p> <p>Burnett, R. W.—Maintenance Regulation Cards . . . *7</p> <p>Burrard Inlet Tunnel and Bridge Co. . 109, 185, 433, 447, 725, 909, 1013</p>	<p>Development . . . 43, 51, 129, 141, 183, 211, 285, 299, 367, 485, 553, 649, 733, 749, 855, 929, 1029</p> <p>Finance, Meetings, etc. . . 51, 107, 197, 205, 211, 275, 287, 289, 355, 375, 453, 535, 545, 557, 617, 749, 833, 913, 947, 1014</p> <p>Hotel and Station at Brandon, Man. . . *751</p> <p>Hotel at Port Arthur, Ont. 197</p> <p>Report . . . 1003</p> <p>Rolling Stock . . . 45, 131, 213, 297, 365, 481, 569, 647, 743, 867, 951, 1043</p> <p>Saskatoon Station . . . *929</p> <p>Statistics . . . 103, 177, 361</p> <p>Canadian Northern Telegraph Co. . . 63, 223, 403, 581, 671, 687, 771, 869, 969, 1059</p> <p>Canadian Northern Western Ry. . . . 931, 1031</p> <p>Canadian Pacific Ry.— Annual Meeting . . . 925</p> <p>Appointments . . . 49, 139, 219, 301, 385, 491, 579, 671, 763, 863, 955, 1053</p> <p>Bridge over Old Man River . . . *215</p> <p>Business Opportunities in the West . . 275</p> <p>Cars, Steel Frame Box . . . *5</p> <p>Construction Contracts . . . 299</p> <p>Development . . . 37, 51, 127, 141, 215, 273, 293, 369, 371, 479, 533, 621, 731, 749, 859, 933, 1025</p> <p>Directors' Inspection . . . 957</p> <p>Finance, Meetings, etc. . . 51, 107, 117, 139, 197, 275, 355, 453, 535, 545, 617, 749, 833, 913, 1017, 1045</p> <p>Fort William Union Station . . . 31, *915</p> <p>Hotel Improvements . . . 361</p> <p>Irrigation Work . . . 339</p> <p>Land Settlement . . . 45</p> <p>Locomotive, Consolidation, with Super-heater . . . *165</p> <p>Report . . . 849</p> <p>Rolling Stock . . . *5, 45, 131, 213, *297, 365, 481, 569, 647, 743, 867, 951, 1043</p> <p>Statistics . . . 103, 177, 361</p> <p>Steel Centre Sills . . . *947</p> <p>Steel Frame Box Cars . . . *667</p> <p>Suburban Tank Locomotives . . . *813</p> <p>Telegraphs . . . 63, 223, 303, 403, 687, 771, 969, 1059</p> <p>Telephone Dispatching . . . 273</p> <p>Toronto Office Building . . . 957</p> <p>Train and Yard Men's Pay Award . . . 577</p> <p>Windsor St. Station, Montreal . . . *293</p> <p>Y.M.C.A. at White River . . . 39</p> <p>Canadian Railway Club . . . 439</p> <p>Canadian Society of Civil Engineers. . . 142, 387, 1017, 1027</p> <p>Canadian Ticket Agents' Association. . 179, 299, 770, 939, 1049</p> <p>Canadian Western Lumber Co. 447</p> <p>Canadian Western Ry. 447, 1013</p> <p>Cape Breton Ry. 103, 177, 361</p> <p>Caraquet Ry. 103, 177, 361</p> <p>Cariboo, Barkerville & Willow River Ry. 185, 299, 349</p> <p>Carillon and Grenville Ry. . . 103, 177, 361</p> <p>Car Shortage, No Canadian . . . 51</p> <p>Cars, Steel Freight . . . 1</p> <p>Cars, The Tait Suburban . . . *337</p> <p>Castings, Iron, Defects and Remedies. . *801</p> <p>Central Canada Ry. 947</p> <p>Central Counties Ry. 103, 489</p> <p>Central Ontario Ry.— Development . . . 51, 109, 141, 271, 273, 369, 653</p> <p>Finance, Meetings, Etc. . . 287, 489, 545</p> <p>Statistics . . . 103, 177, 361</p> <p>Central Railway and Engineering Club of Canada . . . 35</p> <p>Central Ry. of Canada . . . 495</p> <p>Central Vermont Ry. 139, 645, 853</p> <p>Chicago and Kalamazoo Terminal Rd. . . 1007</p> <p>Chicago, Detroit and Canada Grand Trunk Jct. Rd. . . . 53, 1007</p> <p>Chicago, Milwaukee and Puget Sound Ry. . 271</p> <p>Chicago, Milwaukee and St. Paul Ry. . . 1013</p> <p>Clegg T. Should the Brake Power on Freight Cars be Increased . . . 705</p> <p>Coal, Weighing in Ontario . . . 89</p> <p>Collingwood Southern Ry. 935</p> <p>Columbia and Alaska Ry. 185</p> <p>Columbia and Western Ry. . . 37, 47, 215, 273</p> <p>Commercial Cable Co. 303, 1053</p> <p>Comox Logging and Ry. Co. . . 185, 299, 349, 447, 627</p> <p>Crombie D. Efficiency in Transportation. . 341</p> <p>Crossings, Farm, Regulations . . . 179</p> <p>Crossings, Highway, Regulations . . . 561</p>
C		
<p>Cabano Ry. 349</p> <p>Calgary and Edmonton Ry. . . 37, 127, 215, 273, 477, 735, 997</p> <p>Calgary and Fernie Ry. 109, 349, 373</p> <p>Campbellford, Lake Ontario and Western Ry. . . 37, 103, 273, 933</p> <p>Canada and Gulf Terminal Ry. . . 19, 825, 853, 909</p> <p>Canada Atlantic Ry. . . 51, 103, 107, 177, 197, 275, 355, 361, 453, 537, 617, 749, 833, 913, 947, 1009, 1017</p> <p>Canada Iron Corporation . . . 297</p> <p>Canada Southern Ry. . . 103, 177, 361, 545, 645</p> <p>Canadian Car Service Bureau . . . 39</p> <p>Canadian Collieries (Dunsmuir) Ld. . . 445, 645</p> <p>Canadian Express Co. . . 63, 221, 403, 493, 581, 675, 771, 868, 961, 1057</p> <p>Canadian Freight Association. 39, 389, 561, 645, 863</p> <p>Canadian Government Railways . . 139, 195, 219, 433, 525, 957, 997, 1011</p> <p>Canadian Northern Alberta Ry. . . 433, 487, 555, 649, 1031</p> <p>Canadian Northern Branch Lines Co. . . 1029</p> <p>Canadian Northern Express Co. . . 221, 671, 675, 771, 868, 961, 1057</p> <p>Canadian Northern Ontario Ry.— Appointments . . . 49, 671</p> <p>Development . . . 43, 51, 129, 141, 183, 285, 367, 433, 485, 649, 733, 855, 929, 1029</p> <p>Finance, Meetings, etc. . . 205, 375</p> <p>Rolling Stock . . . 45, 131</p> <p>Statistics . . . 103, 177, 361</p> <p>Canadian Northern Pacific Ry. . . 285, 299, 367, 487, 555, 581, 649, 733, 855, 931, 1031</p> <p>Canadian Northern Quebec Ry.— Appointment . . . 49, 51, 219, 491, 671, 955</p> <p>Development . . . 51, 129, 141, 183, 285, 367, 457, 485, 531, 553, 649, 733, 855, 929, 1029</p> <p>Paper Rates from Grand Mere . . . 205</p> <p>Statistics . . . 103, 177, 361</p> <p>Canadian Northern Ry.— Appointments . . . 49, 139, 301, 385, 491, 579, 671, 863, 955, 1053</p>	<p>Calgary and Edmonton Ry. . . 37, 127, 215, 273, 477, 735, 997</p> <p>Calgary and Fernie Ry. 109, 349, 373</p> <p>Campbellford, Lake Ontario and Western Ry. . . 37, 103, 273, 933</p> <p>Canada and Gulf Terminal Ry. . . 19, 825, 853, 909</p> <p>Canada Atlantic Ry. . . 51, 103, 107, 177, 197, 275, 355, 361, 453, 537, 617, 749, 833, 913, 947, 1009, 1017</p> <p>Canada Iron Corporation . . . 297</p> <p>Canada Southern Ry. . . 103, 177, 361, 545, 645</p> <p>Canadian Car Service Bureau . . . 39</p> <p>Canadian Collieries (Dunsmuir) Ld. . . 445, 645</p> <p>Canadian Express Co. . . 63, 221, 403, 493, 581, 675, 771, 868, 961, 1057</p> <p>Canadian Freight Association. 39, 389, 561, 645, 863</p> <p>Canadian Government Railways . . 139, 195, 219, 433, 525, 957, 997, 1011</p> <p>Canadian Northern Alberta Ry. . . 433, 487, 555, 649, 1031</p> <p>Canadian Northern Branch Lines Co. . . 1029</p> <p>Canadian Northern Express Co. . . 221, 671, 675, 771, 868, 961, 1057</p> <p>Canadian Northern Ontario Ry.— Appointments . . . 49, 671</p> <p>Development . . . 43, 51, 129, 141, 183, 285, 367, 433, 485, 649, 733, 855, 929, 1029</p> <p>Finance, Meetings, etc. . . 205, 375</p> <p>Rolling Stock . . . 45, 131</p> <p>Statistics . . . 103, 177, 361</p> <p>Canadian Northern Pacific Ry. . . 285, 299, 367, 487, 555, 581, 649, 733, 855, 931, 1031</p> <p>Canadian Northern Quebec Ry.— Appointment . . . 49, 51, 219, 491, 671, 955</p> <p>Development . . . 51, 129, 141, 183, 285, 367, 457, 485, 531, 553, 649, 733, 855, 929, 1029</p> <p>Paper Rates from Grand Mere . . . 205</p> <p>Statistics . . . 103, 177, 361</p> <p>Canadian Northern Ry.— Appointments . . . 49, 139, 301, 385, 491, 579, 671, 863, 955, 1053</p>	<p>Development . . . 43, 51, 129, 141, 183, 211, 285, 299, 367, 485, 553, 649, 733, 749, 855, 929, 1029</p> <p>Finance, Meetings, etc. . . 51, 107, 197, 205, 211, 275, 287, 289, 355, 375, 453, 535, 545, 557, 617, 749, 833, 913, 947, 1014</p> <p>Hotel and Station at Brandon, Man. . . *751</p> <p>Hotel at Port Arthur, Ont. 197</p> <p>Report . . . 1003</p> <p>Rolling Stock . . . 45, 131, 213, 297, 365, 481, 569, 647, 743, 867, 951, 1043</p> <p>Saskatoon Station . . . *929</p> <p>Statistics . . . 103, 177, 361</p> <p>Canadian Northern Telegraph Co. . . 63, 223, 403, 581, 671, 687, 771, 869, 969, 1059</p> <p>Canadian Northern Western Ry. . . . 931, 1031</p> <p>Canadian Pacific Ry.— Annual Meeting . . . 925</p> <p>Appointments . . . 49, 139, 219, 301, 385, 491, 579, 671, 763, 863, 955, 1053</p> <p>Bridge over Old Man River . . . *215</p> <p>Business Opportunities in the West . . 275</p> <p>Cars, Steel Frame Box . . . *5</p> <p>Construction Contracts . . . 299</p> <p>Development . . . 37, 51, 127, 141, 215, 273, 293, 369, 371, 479, 533, 621, 731, 749, 859, 933, 1025</p> <p>Directors' Inspection . . . 957</p> <p>Finance, Meetings, etc. . . 51, 107, 117, 139, 197, 275, 355, 453, 535, 545, 617, 749, 833, 913, 1017, 1045</p> <p>Fort William Union Station . . . 31, *915</p> <p>Hotel Improvements . . . 361</p> <p>Irrigation Work . . . 339</p> <p>Land Settlement . . . 45</p> <p>Locomotive, Consolidation, with Super-heater . . . *165</p> <p>Report . . . 849</p> <p>Rolling Stock . . . *5, 45, 131, 213, *297, 365, 481, 569, 647, 743, 867, 951, 1043</p> <p>Statistics . . . 103, 177, 361</p> <p>Steel Centre Sills . . . *947</p> <p>Steel Frame Box Cars . . . *667</p> <p>Suburban Tank Locomotives . . . *813</p> <p>Telegraphs . . . 63, 223, 303, 403, 687, 771, 969, 1059</p> <p>Telephone Dispatching . . . 273</p> <p>Toronto Office Building . . . 957</p> <p>Train and Yard Men's Pay Award . . . 577</p> <p>Windsor St. Station, Montreal . . . *293</p> <p>Y.M.C.A. at White River . . . 39</p> <p>Canadian Railway Club . . . 439</p> <p>Canadian Society of Civil Engineers. . . 142, 387, 1017, 1027</p> <p>Canadian Ticket Agents' Association. . 179, 299, 770, 939, 1049</p> <p>Canadian Western Lumber Co. 447</p> <p>Canadian Western Ry. 447, 1013</p> <p>Cape Breton Ry. 103, 177, 361</p> <p>Caraquet Ry. 103, 177, 361</p> <p>Cariboo, Barkerville & Willow River Ry. 185, 299, 349</p> <p>Carillon and Grenville Ry. . . 103, 177, 361</p> <p>Car Shortage, No Canadian . . . 51</p> <p>Cars, Steel Freight . . . 1</p> <p>Cars, The Tait Suburban . . . *337</p> <p>Castings, Iron, Defects and Remedies. . *801</p> <p>Central Canada Ry. 947</p> <p>Central Counties Ry. 103, 489</p> <p>Central Ontario Ry.— Development . . . 51, 109, 141, 271, 273, 369, 653</p> <p>Finance, Meetings, Etc. . . 287, 489, 545</p> <p>Statistics . . . 103, 177, 361</p> <p>Central Railway and Engineering Club of Canada . . . 35</p> <p>Central Ry. of Canada . . . 495</p> <p>Central Vermont Ry. 139, 645, 853</p> <p>Chicago and Kalamazoo Terminal Rd. . . 1007</p> <p>Chicago, Detroit and Canada Grand Trunk Jct. Rd. . . . 53, 1007</p> <p>Chicago, Milwaukee and Puget Sound Ry. . 271</p> <p>Chicago, Milwaukee and St. Paul Ry. . . 1013</p> <p>Clegg T. Should the Brake Power on Freight Cars be Increased . . . 705</p> <p>Coal, Weighing in Ontario . . . 89</p> <p>Collingwood Southern Ry. 935</p> <p>Columbia and Alaska Ry. 185</p> <p>Columbia and Western Ry. . . 37, 47, 215, 273</p> <p>Commercial Cable Co. 303, 1053</p> <p>Comox Logging and Ry. Co. . . 185, 299, 349, 447, 627</p> <p>Crombie D. Efficiency in Transportation. . 341</p> <p>Crossings, Farm, Regulations . . . 179</p> <p>Crossings, Highway, Regulations . . . 561</p>
Articles marked with an asterisk are accompanied by maps, portraits or other illustrations		

STEAM RAILWAY AND GENERAL MATTER—Continued

<p>Crossings, Construction and Maintenance, Apportionment of 561 Crow's Nest Southern Ry. 103, 177, 361, 1047 Cumberland Ry. and Coal Co. 103, 177, 361, 645</p> <p style="text-align: center;">D</p> <p>Darlington F., Present Status and Tendencies of Railway Electrification 421 Delaware and Hudson Co. 373, 489, 547, 863 Desharnais E., How to Improve the Roadbed, 357 Detroit, Grand Haven and Milwaukee Ry.—51, 53, 107, 197, 275, 355, 453, 537, 617, 749, 833, 913, 947, 1007, 1009, 1017 Detroit River Tunnel, Engineering Features of *425 D'Israeli Asbestos Co. 45, 645 Diamond Ry. and Coal Co. 19, 45, 51, 109, 141, 349, 369, 909 Dominion Atlantic Ry.— Appointments 139, 1053 Development 19, 185, 271, 349, 373, 447, 457, 459, 489, 533, 575, 725 Finance, Meetings, etc. 47, 117, 205, 287, 375, 489, 545, 667, 766, 855, 947, 1045 Statistics 103, 177, 361 Dominion Express Co. 63, 221, 303, 403, 581, 675, 771, 869, 1057 Dominion Government Telegraphs 63, 223, 581, 771, 869, 969, 1059 Dominion Grade Crossing Fund 835 Dominion Telegraph Co. 687 Dominion Wireless Telegraph-Telephone Co. 869 Duluth, Rainy Lake and Winnipeg Ry. 47, 49, 491 Duluth, South Shore and Atlantic Ry.— Appointments 385 Development 39, 51 Finance, Meetings, Etc. 51, 107, 197, 275, 355, 453, 535, 617, 749, 833, 913, 1017 Report 895 Duluth, Virginia and Winnipeg Ry. 553 Duluth, Winnipeg and Pacific Ry. 43, 129, 557, 649, 733, 857</p> <p style="text-align: center;">E</p> <p>Eastern British Columbia Ry. 103, 177, 361 Eastern Canadian Passenger Association 39, 113, 473 Eastern Townships Ry. 19, 273, 349, 447, 457 Edmonton and Slave Lake Ry. 43, 273, 367 Edmonton, Dunvegan and British Columbia Ry. 185, 273, 349 Edmonton, Yukon and Pacific Ry. 103 Electrification, Present Status and Tendencies of Railway 421 Elgin and Havelock Ry. 103, 177, 361 Elkhorn Northern Ry. 271, 1013 Engineers' Club of Toronto 35, 142, 1011 Erie, London and Tillsonburg Ry. 109, 185, 349, 373, 447, 457 Esquimalt and Nanaimo Ry.— Development 37, 51, 217, 273, 283, 299, 371, 459, 479, 533, 623, 731, 861, 937, 1027 Finance, Meetings, Etc. 287, 375 Rolling Stock 181 Statistics 103 Essex Terminal Ry. 433, 447, 569, 1013 Evans, G. I.—An Experimental Mallet Articulated Locomotive *249 A Graphical Record for Road Tests *617 C.P.R. Suburban Tank Locomotives *813 Express Companies, Among the, 63, 221, 303, 403, 581, 675, 771, 869, 961, 1057</p> <p style="text-align: center;">F</p> <p>Farmers' Ry. 109 Fort Erie and Buffalo Bridge Co. 349 Fort William Terminal and Bridge Co. 935 Frank and Grassy Mountain Ry. 111 Fraser River Lumber Co. 349 Fredericton and Grand Lake Ry. and Coal Co. 349, 359, 547 Freight Car Rates per Diem 265 Freight Statistics 361 Freight Tariffs, Construction 209 Fuel Consumption, Locomotive 387 Fuel Economy on Testing Plants and Railways *81</p> <p style="text-align: center;">G</p> <p>Gatineau and Ungava Ry. 19, 433, 449 Geodetic Survey of Canada 379 Georgian Bay and Seaboard Ry. 127, 287, 293, 371, 375, 479, 575, 621, 731, 935, 1025 Goderich Elevator and Transit Co. 63 Grade Separation 333 Graham Island Ry. 19, 185, 299, 351, 725, 825 Grain Elevators, Saskatchewan Commission 1059 Grand Rapids Terminal Rd. 53, 1007 Grain Elevator Notes 63, 223, 305, 393, 772, 869, 961, 1059 Grand Trunk Jct. Ry. 53, 1007 Grand Trunk Pacific Branch Lines Co.— Development 183, 211, 273, 289, 379, 483, 553, 845 Finance, Meetings, etc. 375, 769, 853</p>	<p>Grand Trunk Pacific Elevator Co. 63 Grand Trunk Pacific Ry.— Appointments 49, 139, 219, 301, 385, 491, 579, 673, 763, 863, 957, 1053 Development 31, 51, 137, 141, 181, 289, 301, 375, 483, 551, 661, 741, 845, 919, 1033 Finance, Meetings, Etc. 117, 142, 499, 645, 769 Fort William Union Station 31, 915 Inspection 745 Machine Repair Cars *837 Report 1007 Rolling Stock 45, 131, 213, 297, 481, 569, 647, 951, 1043 Terminals at St. John, N.B. 287 Grand Trunk Pacific Telegraph Co. 303, 493, 869, 969, 1053, 1059 Grand Trunk Ry.— Appointments 49, 139, 219, 301, 385, 491, 581, 673, 763, 863, 957, 1053 Apprentice System *435 Development 47, 137, 191, 289, 301, 373, 473, 537, 639, 749, 751, 835, 857, 915, 1035 Finance, Meetings, etc. 47, 51, 107, 197, 275, 287, 355, 453, 489, 537, 617, 749, 769, 833, 913, 947, 1017 Inspection 745 Marker Sockets on Trains 521 Pacific Type Locomotive *857 Reports and Meetings 391, 487, 1009 Rolling Stock 213, 297, 365, 481, 569, 647, 743, 867, 953 Statistics 103, 177, 361 Subsidiary Companies 53, 1007 Telegraphs 63 Telephone Dispatching 931 Train and Yard Men's Pay Award 577 Grand Trunk Western Ry. 47, 49, 51, 53, 107, 197, 275, 355, 453, 537, 545, 617, 749, 833, 913, 1007, 1009, 1017 Great Northern Express Co. 493 Great Northern Mining and Ry. Co. 351, 449, 725 Great Northern Ry.— Appointments 139 Development 29, 51, 107, 141, 187, 275, 361, 439, 537, 623, 735, 845, 927, 1047 Great North Western Telegraph Co. 223, 403, 687, 771, 969 Guarantees, Railway, in B.C. 359 Guelph and Goderich Ry. 933 Guelph Jct. Ry. 205, 287, 433, 489, 1045 Gulf Shore Ry. 103</p> <p style="text-align: center;">H</p> <p>Hackett, C. L., Railway Signaling *999 Ha Ha Bay Ry. Appointments 957 Developments 19, 51, 109, 141, 449, 457, 627 Rolling Stock 131, 569, 647, 743 Halifax and Eastern Ry. 449, 547, 627, 725, 825, 911 Halifax and South Western Ry. Appointments 673 Development 449, 457, 727 Finance, Meetings, Etc. 489 Rolling Stock 481 Statistics 103, 177, 361 Hampton and St. Martin's Ry. 103, 177, 361 Hartland and Miramichi Ry. 351, 359, 547 Hereford Ry. 103, 177, 361 High River and Hudson Bay Ry. 1013 Howe Sound and Northern Ry. 351, 449, 547, 627 Howe Sound, Pemberton Valley and Northern Ry. 109, 299 (See also Howe Sound and Northern Ry.) Hudson Bay, A Railway to 39, 97, 179, 275, 373, 433, 535, 617, 745, 819, 917, 1049 Hudson's Bay and Pacific Ry. 351, 449, 547, 627, 727, 749, 771, 823, 861, 911</p> <p style="text-align: center;">I</p> <p>Indian River Ry. 109, 1013 Intercolonial Ry.— Appointments 49, 139, 219, 385, 673, 763, 957, 1053 Branch Lines 17, 615 Buildings at Campbellton, N.B. 861 Development 19, 109, 185, 211, 351, 449, 459, 549, 629, 727, 749, 825, 911, 1013 Finance 195, 489, 499, 545, 645, 947 Gas Plant at Moncton 770 Rolling Stock 45, 131, 213, 297, 481, 647, 763, 867, 951, 1043 Sleeping Cars 179 Statistics 103, 177, 361 (See also Canadian Government Railways.) International Bridge Co. 53, 1007 International Railway Fuel Association 191, 421 International Ry. of New Brunswick.— Appointments 385 Development 19, 51, 109, 141, 351, 359, 449, 457, 727, 729, 853 Rolling Stock 867, 951, 1043 Statistics 103 International Society of Railway Financial</p>	<p>Officers 1031 International Traffic Control 837 Inverness Ry. and Coal Co. 103, 177, 361, 449, 457, 659, 727, 845 Investments, British, in Canada 483, 767 Irondale, Bancroft and Ottawa Ry.— Appointments 387, 491 Development 485, 553, 653 Statistics 103, 177, 361 Iron Range Ry. 109, 271, 281 Island Valley Ry. 185, 299, 351</p> <p style="text-align: center;">J</p> <p>James Bay and Eastern Ry. 183, 367, 433, 855, 1029 Joliette and Lake Manuan Ry. 449, 457, 631, 727</p> <p style="text-align: center;">K</p> <p>Kamloops and Yellowhead Pass Ry. 19, 273, 351 Kaslo and Slocan Ry. 103, 177, 361, 845 Kent Northern Ry. 103, 177, 361 Kettle River Valley Ry. Appointments 763 Development 273, 299, 459, 651 Finance, Meetings, Etc. 545 Statistics 103, 177, 361 Kettle Valley Lines 19, 185, 271, 351, 449, 549, 629, 727, 827, 911, 1015 Kingston and Pembroke Ry. 103, 177, 361, 859 Kingston, Smith's Falls and Ottawa Ry. 191, 373, 433, 454, 473 Klondike Mines Ry. 103, 177, 361, 827, 853 Kootenay and Alberta Ry. 1015 Kootenay Central Ry. 127, 371, 459, 479, 533</p> <p style="text-align: center;">L</p> <p>Lachine, Jacques Cartier and Maisonneuve Ry. 289, 373, 537, 1035 Lacombe and Brazeau Ry. 351, 369, 911 Lac Seul, Rat Portage and Keewatin Ry. 111, 271, 281, 449, 457 Lake Erie and Detroit River Ry. 103 Lake, H. B., Copper and Steel for Locomotive Fire Boxes 17 Lake, H. B., Water Supply for Railways *755 Lake Superior Corporation 645, 769, 853, 903 Lake Temiskaming Colonization Ry. 859 L'Avenir and Melbourne Ry. 449, 457 Legislation, Alberta 369 British Columbia 299 Dominion 273, 373, 433 New Brunswick 359 Nova Scotia 459 Ontario 281 Quebec 531 Legislation, Dominion, Requirements for 453 Lenore-Mount Sicker Ry. 103 Lethbridge Collieries Co. 911 Little Nation Ry. 211, 451, 457, 531, 727 Liverpool and Milton Ry. 103, 177, 361, 827 Liverpool and Milton Tramway Co. 251, 459, 735 Lloydminster and North Western Ry. 1015 Locomotive Consolidation, With Superheater, C.P.R. *165 Locomotive Mallet, Articulated, C.P.R. *249, 455 Locomotive, Manitoba's First 459 Locomotive, Turbo-Electric, A. 29, 87, *761 Locomotive Boilers, Review of, Past and Present, with suggestions *989 Item in Maintenance of 359 Improvements in *609, *707, *805, *879 Locomotive Engineers, Requests of 821, 1031 Locomotive Fireboxes, Copper and Steel for 17 Locomotive Fuel Consumption 517 Locomotive Repair Shops, Economy in 387 Locomotives, Exhaust Nozzle for *95 Locomotives, Pacific Type, G.T.R. *857 Locomotives, Handling 747 Locomotives, Regulation re 47 Locomotives, Suburban Tank *813 London and Port Stanley Ry.— Development 19, 111, 271, 549 Finance 117, 645 Statistics 103, 177, 361 London and South Eastern Ry. 645 Long Soo and Abitibi Ry. 531, 549 Lotbiniere and Megantic Ry. 103, 177, 361, 451, 457 Lowe, T. W., Review of Past and Present Locomotive Boiler with suggestions *989</p> <p style="text-align: center;">M</p> <p>McLaren, P., Some Thoughts on Training Apprentices 893 McVeigh, E. J., Efficiency of Storekeeper 529 Mabou Coal and Ry. Co. 451, 459, 727 Machine Repair Cars *837 Machine Shop System and Economy 15 Mackenzie, Mann and Co. Flotations in Europe 557 Ontario Lines Secured by 653 Maine Central Rd. 863 Maintenance Regulation Cards *7 Magnetawan River Ry. 103 Manitoba and Keewatin Ry. 727, 1015</p>
--	---	--

STEAM RAILWAY AND GENERAL MATTER—Continued

<p>Manitoba and North Western Ry. 37, 215, 273, 457, 735, 935</p> <p>Manitoba and South Eastern Ry. 735, 997</p> <p>Manitoba Great Northern Ry. 1047</p> <p>Manitoba Ry. 103</p> <p>Manitoba's Early Railway History 531</p> <p>Manitoba South Western Colonization Ry. 305</p> <p>Manitoulin and North Shore Ry.—</p> <p style="padding-left: 20px;">Appointments 579, 863</p> <p style="padding-left: 20px;">Developments 21, 51, 111, 141, 187, 273, 351, 451, 629, 727, 827, 911, 1027</p> <p style="padding-left: 20px;">Statistics 103, 177, 361</p> <p style="padding-left: 20px;">Subsidy Contracts 35</p> <p>Marconi Wireless Telegraph Co. 223, 403, 687, 969, 1059</p> <p>Margaree Coal and Ry. Co. 21, 451, 457</p> <p>Maritime Coal, Ry. and Power Co. 103, 177, 361, 451, 459, 727</p> <p>Maritime Telegraph and Telephone Co. 303, 581, 771, 969, 1059</p> <p>Marmora Ry. and Mining Co. 103</p> <p>Massawippi Valley Ry. 103, 177, 361, 947</p> <p>Master Car Builders' Association 29</p> <p>Menzies Bay Ry. 187, 299, 351</p> <p>Mexican Route to British Columbia, The 523</p> <p>Michigan Air Line Ry. 53, 1007</p> <p>Michigan Central Rd.—</p> <p style="padding-left: 20px;">Appointments 139, 301, 863</p> <p style="padding-left: 20px;">Development 111, 187, 271, 451, 549, 727, 827, 911</p> <p style="padding-left: 20px;">Pension Fund 347</p> <p style="padding-left: 20px;">Report 379</p> <p style="padding-left: 20px;">Rolling Stock 45, 131, 365, 743, 1043</p> <p style="padding-left: 20px;">Telegraphs 63, 223</p> <p>Midland Continental Ry. 1015</p> <p>Midland Ry. of Manitoba.—</p> <p style="padding-left: 20px;">Development 29, 361, 439, 537, 623, 749, 845, 927</p> <p style="padding-left: 20px;">Statistics 103, 177, 361</p> <p>Midland Terminal Ry. 645</p> <p>Midway and Vernon Ry. 299, 353</p> <p>Mineral Range Rd.—</p> <p style="padding-left: 20px;">Appointments 385</p> <p style="padding-left: 20px;">Finance Meetings, etc. 51, 107, 197, 275, 355, 453, 535, 617, 749, 833, 913, 1017</p> <p style="padding-left: 20px;">Rolling Stock 297</p> <p>Minneapolis, St. Paul and Sault Ste. Marie Ry.—</p> <p style="padding-left: 20px;">Development 39, 51, 217, 293, 371, 479, 535, 847, 861, 913</p> <p style="padding-left: 20px;">Finance, Meetings, etc. 107, 197, 275, 355, 453, 545, 617, 749, 833, 1017</p> <p style="padding-left: 20px;">Report 905</p> <p style="padding-left: 20px;">Rolling Stock 365</p> <p>Moncton and Buctouche Ry. 103, 177, 361</p> <p>Montreal and Atlantic Ry. 103, 177, 361</p> <p>Montreal and Province Line 103, 177, 361</p> <p>Montreal and Vermont Jct. Ry. 103, 177, 361, 545</p> <p>Montreal Central Terminal Ry. 21, 549</p> <p>Montreal, Kapitchewan and Rupert's Bay Ry. 35, 115, 21, 187, 433, 451</p> <p>Montreal Telegraph Co. 223, 303</p> <p>Montreal Warehousing Co. 287</p> <p>Morrissey, Fernie and Michel Ry. 103, 117, 177, 271, 301, 361, 769</p>	<p>Ontario Hudson's Bay and Western Ry. 1015</p> <p>Ontario Northern and Timagami Ry. 451, 457, 631</p> <p>Orford Mountain Ry. 105, 117, 177, 287, 361, 1025</p> <p>Ottawa and New York Ry. 105, 177, 361</p> <p>Ottawa, Brockville and St. Lawrence Ry. 353, 373</p> <p>Ottawa, Montreal and Eastern Ry. 21, 187, 353, 373</p> <p>Ottawa, Northern and Western Ry. 37, 273, 933</p> <p>Ottawa, Rideau Valley and Brockville Ry. 353, 433, 561, 629, 829, 915, 1035</p> <p>Ottawa Valley Ry. 21, 211</p> <p>Owen Sound and Meaford Ry. 451, 1015</p>	<p>Railway Electrification, Present Status and Tendency of 421</p> <p>Railway Employes' Protection 1045</p> <p>Railway Finance Meetings, etc. 47, 117, 205, 287, 375, 489, 545, 645, 769, 853, 947, 1045</p> <p>Railway, First Canadian 673</p> <p>Railway Lands Patented 205, 305, 477, 631, 735, 803, 907, 997</p> <p>Railway Location Plans, Filing of 1001</p> <p>Railways and Canals Department 139, 491</p> <p>Railways, Cost of Operating 623</p> <p>Railway Signaling 959, 999</p> <p>Railways in Nova Scotia 379</p> <p>Railway Right of Way, Weeds on 771</p> <p>Railway Storekeepers' Association 477</p> <p>Railways, The, and Forest Fires 457</p> <p>Railway Telegraph Superintendents Association 403, 493, 581</p> <p>Rates, Freight Car, Per Diem 265</p> <p>Rates, International Traffic 531, 639</p> <p>Red Mountain Ry. 105, 177, 361, 1047</p> <p>Reid Newfoundland Co.—</p> <p style="padding-left: 20px;">Appointments 491, 581, 673, 763, 863</p> <p style="padding-left: 20px;">Development 23, 111, 187, 273, 287, 359, 451, 549, 631, 729, 831, 911, 1011, 1015</p> <p style="padding-left: 20px;">Finance 489, 769</p> <p style="padding-left: 20px;">Road Tests, Graphical Record for 617</p> <p style="padding-left: 20px;">Roadbed, How to Improve the 357, 459</p> <p style="padding-left: 20px;">Roberval and Saguenay Ry. 913</p> <p style="padding-left: 20px;">Rocky Mountain Collieries 273</p> <p style="padding-left: 20px;">Rolling Stock Notes 45, 131, 213, 297, 365, 481, 569, 647, 743, 867, 951, 1043</p> <p style="padding-left: 20px;">Rolling Stock, Old Northern Ry. 1055</p> <p style="padding-left: 20px;">Rolling Stock Statistics 115</p> <p style="padding-left: 20px;">Rutland and Noyan Ry. 105, 179, 361</p> <p style="padding-left: 20px;">Rutland Rd. 139, 219</p> <p style="padding-left: 20px;">Rutland Transit Co. 219</p>
<p>P</p>		
<p>Pacific and Alaska Ry. 299</p> <p>Pacific and Atlantic Ry. 271, 273</p> <p>Pacific and North Western Ry. 111</p> <p>Pacific and Peace River Ry. 1015</p> <p>Pacific Cable Board 869</p> <p>Pacific Coast Coal Mines, Ltd. 23, 51, 141</p> <p>Pacific Northern and Omineca Ry. 457, 483</p> <p>Pacific Ry. 353</p> <p>Paper Rates from Grand Mere 205</p> <p>Peace River Great Western Ry. 1015</p> <p>Peace River Ry. 549</p> <p>Pembroke Southern Ry. 105</p> <p>Penticton Ry. 275, 299, 360</p> <p>Pere Marquette Rd. 105, 177, 301, 361, 863</p> <p>Personal 33, 133, 221, 293, 361, 475, 565, 765, 865, 953, 1039</p> <p>Phillipsburg Ry. and Quarry Co. 105, 177, 361, 769</p> <p>Pincher Creek, Cardston and Montana Ry. 727, 829, 911, 1015</p> <p>Pine Pass Ry. 23, 353, 373, 629</p> <p>Piston Valves, Hints on 217</p> <p>Pontiac and Renfrew Ry. 105</p> <p>Pontiac Central Ry. 1015</p> <p>Pontiac, Oxford and Northern Rd. 1007</p> <p>Port Hood Richmond Ry. Coal Co. 451, 459, 769, 829</p> <p>Portland Canal Short Line Ry.—</p> <p style="padding-left: 20px;">Development 131, 369, 473, 569, 629, 727, 771, 829, 911</p> <p style="padding-left: 20px;">Rolling Stock 365, 491, 867</p> <p>Port Moody, Indian River and Northern Ry. 187, 299, 353, 549, 631, 727, 861, 937</p> <p>Prince Albert and Hudson Bay Ry. 23, 187, 271, 301, 353, 433, 653</p> <p>Prince Edward County Ry. 139, 763</p> <p>Prince Edward Island Ry.—</p> <p style="padding-left: 20px;">Appointments 139, 763</p> <p style="padding-left: 20px;">Development 111, 211, 273, 451, 631, 1015</p> <p style="padding-left: 20px;">Finance 195, 499</p> <p style="padding-left: 20px;">Shops 521</p> <p style="padding-left: 20px;">Statistics 103, 177, 361</p> <p>Prince Edward Island Tunnel 23, 831</p> <p>Pullman Car Charges 441</p> <p>Purchasing Agents' Guide 77, 161, 245, 329, 417, 573, 605, 701, 797, 889, 985, 1081</p>	<p>Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co. 105, 205, 305, 735</p> <p>Quebec and Lake St. John Ry.—</p> <p style="padding-left: 20px;">Appointments 49, 673, 957</p> <p style="padding-left: 20px;">Commutation of fares 663</p> <p style="padding-left: 20px;">Development 129, 457, 485, 553</p> <p style="padding-left: 20px;">Finance Meetings, Etc. 47, 117, 205, 213, 287, 375, 489, 545, 645, 663, 769, 853, 947, 1045</p> <p style="padding-left: 20px;">Report 193</p> <p style="padding-left: 20px;">Statistics 105, 177, 361</p> <p style="padding-left: 20px;">Subsidies 137</p> <p>Quebec and New Brunswick Ry. 47, 105, 451, 457, 549, 1045, 1189, 651, 719</p> <p>Quebec Bridge 47, 105, 451, 457, 549, 1045, 1189, 651, 719</p> <p>Quebec Central Ry.—</p> <p style="padding-left: 20px;">Appointments 139, 301</p> <p style="padding-left: 20px;">Development 23, 51, 111, 141, 181, 221, 289, 375, 489, 561, 645, 769, 866, 947, 957, 1045</p> <p style="padding-left: 20px;">Finance Meetings, Etc. 117, 205, 213</p> <p style="padding-left: 20px;">Rolling Stock 45, 131, 213, 743</p> <p style="padding-left: 20px;">Statistics 105, 177, 361</p> <p style="padding-left: 20px;">Subsidy Contracts 35</p> <p>Quebec Dual Language Ry. 555</p> <p>Quebec, Montmorency and Charlevoix Ry. 105</p> <p>Quebec, Montreal and Southern Ry.—</p> <p style="padding-left: 20px;">Development 521</p> <p style="padding-left: 20px;">Statistics 105, 177, 361</p> <p style="padding-left: 20px;">Report 729</p> <p>Quebec Oriental Ry. 52, 205</p> <p>Quebec Public Utilities Commission, 52, 643, 723, 913</p> <p>Quebec Ry. Light and Power Co.—See Electric Railways—</p> <p>Quebec Southern Ry. 947</p> <p>Quebec Transportation Club 521</p> <p>Queen's Central Ry. 451, 459, 799</p> <p>Quinze and Blanche River Ry. 947</p>	<p>Salisbury and Harvey Ry. 105, 179, 361</p> <p>Saskatchewan and Southern Ry. 111</p> <p>Saskatchewan Central Ry. 23, 187, 353, 367, 373</p> <p>Saskatchewan Elevator Commission 1059</p> <p>Saskatoon and Hudson Bay Ry. 1015</p> <p>Schomberg and Aurora Ry. 105, 179, 361</p> <p>Shelters, Stations and Agents 115</p> <p>Sleeping Car Reservations 473, 569</p> <p>Sleeping Car Charges 441</p> <p>Signaling Railway 959, 999</p> <p>Smith, W. R.—Economy in Locomotive Repair Shops 387</p> <p>Southampton Ry. 111, 353, 549</p> <p>South East Kootenay Ry. 913</p> <p>Southern Central Pacific Ry. 453, 459, 1027</p> <p>Southern New England Ry. 289, 373, 537, 639, 835</p> <p>South Ontario Pacific Ry. 37, 273, 935</p> <p>Spokane and British Columbia Ry. 105, 179, 361</p> <p>Spokane International Ry. 551, 831</p> <p>Stanstead, Shefford and Chambly Ry. 105, 179, 361</p> <p>Stations, Shelters, and Agents 115</p> <p>Statistics, Railway 103, 113, 177</p> <p>Steel Co. of Canada, Ltd. 581</p> <p>Steel Freight Cars 1</p> <p>Stockall, Arthur—Tools and Formers 715</p> <p>Storekeeper, Efficiency of 529</p> <p>Stoop-off Charge, for Orders on Grain, etc. 527</p> <p>Subsidies, Dominion Railway, for 1910, etc. 457</p> <p>Subsidy Contracts 35, 137, 473, 531, 651, 729, 843, 937, 1027</p> <p>Subsidy Lands in British Columbia 335</p> <p>Superior and Western Ontario Ry. 51, 141</p> <p>Sydney and Louisburg Ry. 105, 179, 361, 375, 453, 459</p>
<p>Q</p>		
<p>Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co. 105, 205, 305, 735</p> <p>Quebec and Lake St. John Ry.—</p> <p style="padding-left: 20px;">Appointments 49, 673, 957</p> <p style="padding-left: 20px;">Commutation of fares 663</p> <p style="padding-left: 20px;">Development 129, 457, 485, 553</p> <p style="padding-left: 20px;">Finance Meetings, Etc. 47, 117, 205, 213, 287, 375, 489, 545, 645, 663, 769, 853, 947, 1045</p> <p style="padding-left: 20px;">Report 193</p> <p style="padding-left: 20px;">Statistics 105, 177, 361</p> <p style="padding-left: 20px;">Subsidies 137</p> <p>Quebec and New Brunswick Ry. 47, 105, 451, 457, 549, 1045, 1189, 651, 719</p> <p>Quebec Bridge 47, 105, 451, 457, 549, 1045, 1189, 651, 719</p> <p>Quebec Central Ry.—</p> <p style="padding-left: 20px;">Appointments 139, 301</p> <p style="padding-left: 20px;">Development 23, 51, 111, 141, 181, 221, 289, 375, 489, 561, 645, 769, 866, 947, 957, 1045</p> <p style="padding-left: 20px;">Finance Meetings, Etc. 117, 205, 213</p> <p style="padding-left: 20px;">Rolling Stock 45, 131, 213, 743</p> <p style="padding-left: 20px;">Statistics 105, 177, 361</p> <p style="padding-left: 20px;">Subsidy Contracts 35</p> <p>Quebec Dual Language Ry. 555</p> <p>Quebec, Montmorency and Charlevoix Ry. 105</p> <p>Quebec, Montreal and Southern Ry.—</p> <p style="padding-left: 20px;">Development 521</p> <p style="padding-left: 20px;">Statistics 105, 177, 361</p> <p style="padding-left: 20px;">Report 729</p> <p>Quebec Oriental Ry. 52, 205</p> <p>Quebec Public Utilities Commission, 52, 643, 723, 913</p> <p>Quebec Ry. Light and Power Co.—See Electric Railways—</p> <p>Quebec Southern Ry. 947</p> <p>Quebec Transportation Club 521</p> <p>Queen's Central Ry. 451, 459, 799</p> <p>Quinze and Blanche River Ry. 947</p>	<p>Railway Act Amendments 531</p> <p>Railway Activity, Canadian 93</p> <p>Railway and Canal Expenditure 1001</p> <p>Railway Building in Canada 461</p> <p>Railway Charters, Granting of 369</p> <p>Railway Construction Notes 539</p> <p>Railway Development 19, 109, 185, 211, 271, 301, 349, 447, 547, 627, 725, 825, 969, 1013, 1027</p>	<p>T</p> <p>Temiscouata Ry.—</p> <p style="padding-left: 20px;">Finance, Meetings, etc. 47, 117, 375, 489, 545, 667, 853, 947, 1045</p> <p style="padding-left: 20px;">Rolling Stock 131</p> <p style="padding-left: 20px;">Statistics 105, 179, 361</p> <p>Temiskaming and Northern Ontario Ry.—</p> <p style="padding-left: 20px;">Appointments 139, 581</p> <p style="padding-left: 20px;">Development 23, 111, 211, 273, 281, 353, 453, 631, 729, 831, 913, 959, 1017</p> <p style="padding-left: 20px;">Finance 141, 221, 303, 379, 561, 645</p> <p style="padding-left: 20px;">Report 383</p> <p style="padding-left: 20px;">Rolling Stock 131, 365, 481, 569, 743, 867, 953</p> <p style="padding-left: 20px;">Statistics 105, 179, 361</p> <p style="padding-left: 20px;">Telegraphs 63</p> <p style="padding-left: 20px;">Tests, A Graphical Record for Road 617</p> <p>Thessalon and Northern Ry. 47</p>
<p>R</p>		
<p>Railway Act Amendments 531</p> <p>Railway Activity, Canadian 93</p> <p>Railway and Canal Expenditure 1001</p> <p>Railway Building in Canada 461</p> <p>Railway Charters, Granting of 369</p> <p>Railway Construction Notes 539</p> <p>Railway Development 19, 109, 185, 211, 271, 301, 349, 447, 547, 627, 725, 825, 969, 1013, 1027</p>	<p>Railway Act Amendments 531</p> <p>Railway Activity, Canadian 93</p> <p>Railway and Canal Expenditure 1001</p> <p>Railway Building in Canada 461</p> <p>Railway Charters, Granting of 369</p> <p>Railway Construction Notes 539</p> <p>Railway Development 19, 109, 185, 211, 271, 301, 349, 447, 547, 627, 725, 825, 969, 1013, 1027</p>	<p>Railway Act Amendments 531</p> <p>Railway Activity, Canadian 93</p> <p>Railway and Canal Expenditure 1001</p> <p>Railway Building in Canada 461</p> <p>Railway Charters, Granting of 369</p> <p>Railway Construction Notes 539</p> <p>Railway Development 19, 109, 185, 211, 271, 301, 349, 447, 547, 627, 725, 825, 969, 1013, 1027</p>

Articles marked with an asterisk are accompanied by maps, portraits or other illustrations

ELECTRIC RAILWAY DEPARTMENT—Continued

Statistics	145	Finance, Meetings, etc.	*873, 879, 965, 1067	Notes	61, 149, 879, 967
Niagara, Welland and Lake Erie Ry.	965	Notes	401	Report	227
Nipissing Central Ry.—		Rolling Stock	233, 687, 785, 879, 1071	Statistics	145
Development	399, 495, 781, 877	Statistics	145, 177, 361	Toronto Eastern Ry.	59, 187, 433, 685, 877, 963, 967
Finance, Meetings, etc.	967	Quebec Ry., Light, Heat and Power Co.	61, 313, 687, 963, 967, 1071	Toronto Electric Railway Matters	969
Notes	501, 587, 1071			Toronto, Niagara and Western Ry.	497, 585, 685, 965, 1069
Rolling Stock	233, 311, 313, 403, 687	R		Toronto Ry.—	
North Midland Ry.	147, 233, 281, 877	Rainy River Radial Ry.	233, 433	Bylaws	1063
Nova Scotia Hydraulic Co.	767	Regina St. Ry.	147, 311, 401, 497, 683, 965	Cars	*1063
O		Rolling Stock, Limitation of weight in....	*777	Development	147, 233, 311, 401, 499, 685, 877
Ontario Railway Act	281	Rural Ry. of Manitoba	111, 273, 965, 1069	Finance, Meetings, etc.	61, 229, 313, 497, 587, 687, 783, 879, 967, 1071
Ontario Railway and Municipal Board.	281, 499, 585, 625	S		Judgment	499, 585
Ontario West Shore Ry.	399, 495, 585, 683, 781, 877, 965, 1067	St. George Electric Co.	401, 783	Notes	149, 233, 403, 501, 587, 687, 879, 967, 1071
Oshawa Ry.	145	St. John Ry.—		Report	225
Ottawa and Kingston Electric Ry.	1067	Development	59, 497	Statistics	145
Ottawa and St. Lawrence Ry.	59	Notes	501, 587	Toronto Suburban Ry.—	
Ottawa, Brockville and St. Lawrence Ry.	61	Report	583	Development	149, 281, 311
Ottawa Electric Ry.—		Statistics	145	Finance, Meetings, etc.	143
Development	233, 399, 497, 585, 781, 877, 965, 1067	St. Stephen Street Ry.	145	Notes	687
Notes	61, 149	St. Thomas Street Ry.—		Rolling Stock	785
Report	227	Development	59, 281, 401, 497, 1069	Statistics	145
Rolling Stock	233	Finance	229, 685, 879, 967, 1071	Toronto Tube Question	871
Statistics	145	Notes	149, 403, 1071	Track laid in 1909	63, 143
Wages	501	Rolling Stock	61, 233	Track, Street Railway	871
Ottawa, Rideau Valley and Brockville Ry.	59	Statistics	145	Traffic, Electric Freight and Express, Notes on	677
P		Sandwich, Windsor and Amherstburg Ry.	145, 401, 403, 785	Training New Man on Both Ends of Car.	775
Peoples Ry.	59, 147, 233, 281, 399, 497, 683, 687, 781, 877, 965, 1069	Sarnia St. Ry.	59, 63, 143, 145	W	
Peterboro Radial Ry.	145, 1069	Saskatoon St. Ry.	685	Western Central Ry.	149, 233, 281, 551, 1069
Pictou County Electric Co.	145, 783	Sherbrooke Ry. and Power Co.—		Windsor and Tecumseh Electric Ry.	401, 785
Pigeon Lake and Ferintosh Ry.	1067	Appointments	61	Windsor, Essex and Lake Shore Rapid Ry.	61, 145, 149, 501, 1071
Port Arthur and Fort William Electric Ry.—		Development	59, 233, 401, 497, 531, 587, 681, 783, 877, 965	Winnipeg Electric Ry.—	
Development	59, 143, 147, 233, 311, 399, 683, 783, 877	Finance, Meetings, etc.	313	Development	59, 143, 149, 233, 313, 497, 585, 685, 877, 965
Finance	313, 401, 685, 783, 877, 1069	Notes	879, 1071	Finance, Meetings, etc.	61, 143, 229, 313, 401, 497, 557, 587, 687, 783, 879, 967, 1071
Notes	61, 149, 313, 587, 687, 866, 879, 1071	Statistics	145	Militia vs. Street Cars	143
Rolling Stock	233, 785	Simcoe Ry. and Power Co.	147, 281, 401, 783	Notes	61, 149, 587, 879, 967
Statistics	63, 145	South Western Traction Co.	61, 145, 313	Power Plant Accident	55
Preston and Berlin St. Ry.	145, 147	(See also London and Lake Erie Ry. and Transportation Co.)		Report	307
Q		Statistics for 1909-10.	143, 145	Rolling Stock	501
Quebec and Island of Orleans Ry.	311	Stratford Ry.	685, 783, 877, 965	Statistics	63, 145
Quebec and Saguenay Ry.	59	Suburban Tramway and Power Co.	401, 531	Winnipeg, Selkirk and Lake Winnipeg Electric Ry.	61, 307
Quebec County Ry.	585	Sydney and Glace Bay Ry.	145	Y	
Quebec Ry., Light and Power Co.—		T		Yarmouth St. Ry.	145
Appointments	61, 139	Three Valley and Vernon Tramway Co.	965		
Development	401, 497, 585, 683, 783	Toronto and York Radial Ry.—			
		Development	311, 401, 497, 585, 877, 965, 1069		

MARINE DEPARTMENT

A		I		Q	
Algoma Central Steamship Co.—		Inland Navigation Companies' Stocks	591	Quarantine Steamboat (Alva)	241
s.s. Thomas J. Drummond	*691	Inspection of Steamboats	319	Quebec as a Port	595
Atlantic and Pacific Ocean Marine.	71, 159, 241, 325, 409, 507, 597, 697, 789, 881, 997, 1075	Insurance, Inland Marine	405	Quebec Province Marine	73, 155, 243, 325, 411, 509, 597, 697, 791, 885, 979, 1079
Alva, Quarantine Steamboat	241	International Water Lines Passenger Association	115	R	
B		J		Richelieu and Ontario Navigation Co.—	
Book Reviews	407, 595, 797	Jaques, C. A., Steamship	*695	Report	237
British Columbia and Pacific Coast Marine.	75, 157, 245, 329, 415, 513, 601, 699, 795, 888, 981, 1081	L		s.s. Rochester	235, 323, *699
British Columbia Survey Steamboat	1073	Lake Grain Shipments	69, 695, 885	S	
Buoy Steamboat for the St. Lawrence.	971	Legislation, Pending	71	St. Andrews Lock and Dam	691
C		M		St. John, N.B., Shipping Statistics	691
Canada, West Indies Route, The	971	Manitoba, Saskatchewan and Alberta Notes.	75, 243, 329, 415, 513, 601, 699, 795, 888, 981, 1080	St. Lawrence and Chicago Steam Navigation Co. Report	161
Canadian Northern Steamships, Ltd.	71, 159, 301, 321, 385, 491, 505, 671	Mariners and the Criminal Code	695	Sault Ste. Marie Canals Traffic	77, 509, 599, 697, 793, 887, 981, 1079
Canadian Pacific Ry.—		Maritime Provinces and Newfoundland.	73, 153, 241, 325, 411, 509, 597, 697, 791, 885, 977, 1077	Shuniah, Dredge	*505
s.s. Princess May, Salvaging the	975	Merchants Mutual Line s.s. C. A. Jaques.	*695	Statistics, Canadian Shipping	591
Steamboat for Arrow Lakes	973	Merger, Ontario Navigation Companies	237	Steamboat Inspection, Canadian	409
Steamships for B.C. Coast	319	Montreal Harbor Improvements	407	T	
Canal Traffic	409, 1075	Montreal Harbor Traffic Statistics	973	Toronto Harbor Commission	595
Canals, Canadian	237	N		Toronto's Inadequate Port	507
Canals, The Use of U. S.	409	Navigable Waters Protection Act	433, 589	Trent Valley Canal Construction	1073
Coast, Lake and River Officers for 1910.	315, 405	Niagara Navigation Co. Report	153	V	
Coasting Privileges, Canadian	162	Northern Navigation Co.—		Vessels Registered	67, 155, 319, 407, 507, 595, 693, 789, 883, 975, 1075
D		Appointments	49, 139, 301	Vessels Removed from the Register	161, 319, 417, 591, 695, 795, 977, 1073
Dominion Government Quarantine Steamboat (Alva)	693	Report	151	W	
Dominion Marine Association	65, 151	Notices to Mariners	67, 239, 317, 407, 507, 591, 695, 787, 881, 977, 1075	Water Carriage of Goods Act	433, 503, 797, 1073
Dominion Marine Votes for 1910-11	589	O		Welland and Georgian Bay Canals	161, 795
Drydocks, Harbors, etc.	159	Officers of Vessels for 1910	315, 405	Winnipeg to the Rockies, Navigation from.	693
Drydocks, Proposed Construction	881	Ontario and the Great Lakes	73, 155, 243, 325, 413, 511, 599, 699, 791, 885, 979, 1079	Wreck Commissioners' Judgments—	
E		P		Aeota, Stranding of	69
Estevan, Lighthouse and Buoy Steamer	881	Port Colborne s.s.	*239	Athabasca, Grounding of	69
G		Ports and Harbors, Canadian	417	Ben Cruachan, Stranding of	691
Georgian Bay and Welland Canals	161			Cassandra-Advance Investigation	787
Grand Trunk Pacific Steamships	*153			Craigendoran, Stranding of	973
Great Lakes and St. Lawrence River Rate Committee	35, 115			Crown of Castle Accident	597
				Empress of Ireland's Disaster	65
				John Hanlan Collision	787
				Minto-Rosalind Collision	787
				Montezuma, Grounding of	71

Articles marked with an asterisk are accompanied by maps, portraits or other illustrations

PERSONAL—Continued

Kingsmill, Nicoll, K. C., 33	McRae, W. R., 381	Norman, F. L., 581	Robinson, M. O., 866	Tansey, M. E., 491
Kingston, W. E., 385	Mabee, J. P., 221, 381	Norrie, J. D., 491	Robinson, R. V., 139	Tate, D'Arcy, 139, 221, 953, 1039
Kinnear, W. S., 335, 139	MacCallum, H. M., 219	North, W., 1053	Reville, J. E., 957, 1041	Taylor, D. S., 139, 957
Kirkby, W. H., 139	Macdonald, Chas., 955	O	Robson, F. E., 139	Taylor, E. W., 715
Kirkpatrick, W. M., 837	Macdonald, C. A., 139	Oborne, J., 715, 1039	Rolls, W. S., 837	Taylor, J. H., 385
Kistler, V., 715	Macdonald, D. C., 95	O'Donnell, J. C., 35, 49	Rosevear, A. E., 95	Taylor, W. F., 615
Kloephel, W. R., 673	Macdonald, J. B., 715	O'Hayer, E. J., Jr., 491	Rosevear, W. H., 715	Taylor, W. M., 491
Knowlton, L. F., 385	Macdonald, L., 1007	O'Meara, J., 957	Ross, Jas, 565, 657, 765, 1039	Taylor, W. S., 381, 837
Kolb, E. W., 529	Macdonald, Randolph, 135	O'Neill, J. J., 301	Ross, T., 581	Thomson, M. D., 579
Kyle, J., 267	Macdonnell, Hon. Angus, 237	Ogden, I. G., 579, 765	Ross, W. G., 615, 1071	Tidmus, R., 301
L	Macdonnell, H. E., 579	Ogilvy, A. L., 335	Ross, W. Le B., 615	Tiffin, E., 335
Lamb, G., 475	MacInnes, W. R., 431	Oliver, S. S., 715	Rouveau, L. J., 15	Tiffin, S. G., 385
Lambkin, J. B., 267	Mackenzie, A. C., 49	Orttenberger, C. G., 491, 567	Rudder, L. S., 49	Tiffin, W. R., 475, 479, *565, 566
Landers, J. D., 657	Mackenzie, R. J., 381, 865	Osler, E. B., 33, 221, 295, 381	Ruel, G. G., 529	Tilston, W. S., 267
Lanigan, W. B., 837	Mackenzie, W., 33, 221, 381, 475, 565, 865, 1039	P	Ruse, R. E., 581	Timmerman, H. P., 385, 905
La Prairie, F. X., 385	MacLeod, H. W., 301	Parent, F. O., 139	Rutherford, F. A., 673	Todd, E. N., 837
Larmour, R. E., 715, 763	Macmurchy, A., K.C., 865	Parent, S. N., 33	Rutledge, A., 579	Tombs, G., 385, *609
Larson, E., 957	Macpherson, D., 95	Park, P. D., 219	Rutley, J., 385	Travers, E. J., 193
Lash, Z. A., K.C., 33	MacPier, A. D., 475	Parker, R. U., 139	Ruttan, H. N., 381	Trueman, C. D., 765
Lavelle, Jas., 673	Maguire, H. J., 431	Parks, H. F., 49	Ryan, P. E., 529	Tupper, E. A., 385
Lavergne, L., 765	Maguire, T. J., 529	Parr, A. J., 139	Salsbury, W. F., 381	Tuttle, L., 865, 953
Le Batt, L. G., 49	Manarg, C. S., 95, 295	Paterson, N. F., 33	Salter, F. C., 221, 615, 1039	Twist, G., 49
Lee, F., 191	Mahon, F. J., 715	Paterson, R. P., 863	Sandstrom, G., 1053	Tye, W. F., 193
Leitch, J. K.C., 383, 435, 1041	Main, D. T., 301, 383	Paterson, T. W., 35	Saunders, F., 49	U
Leonard, J. W., 219, 837	Mann, D. D., 191	Paton, H., 135, 837	Savage, J. K., 837	Uren, W. J., 491
Leonard, R. W., 657, 953	Manson, G., 431	Patten, B., 301	Schaeffer, H. H., 95	Ussher, C. E., E. 863, 865, 953, 1007
Lester, D. I., 491	Marchand, J. A., 49	Patterson, R., 191, 295	Schreiber, O., 221, 381, 1007	V
Livingston, C. A., 491	Marchen, W. J., 1053	Patterson, T. F., 139, 763	Scalco, C. R., 715	Vallee, L. A., 657
Livingstone, F. S., 475	Marchengo, R. H., 219	Paul, J., 715	Scott, J., 763	Van Arsdoll, O. C., 957
Lichtenhein, A., 15	Markey, J., 221	Pearson, W. H., 219	Scott, J. D., 219	Van Horne, Sir Wm. C., 95, 133, 381, 385, 475, 491, 565, 657, 765, 1039
Lloyd, E. E., 139	Marlow, W. T., 837	Peddle, J., 491, 581	Scott, J. G., 95, 475	Vaughan, H. H., 565, 765, 1007
Logan, R. S., 95, 133, 139	Marlow, W. T., 837	Peers, A., 763	Scott, O., 301, 1053	Vaughan, R. C., 671, 767, 1007
Long, R. W., 191	Marpole, R., 837	Pellatt, Sir Henry M., 953	Scott, J. D., 219	Vaux, G. W., 193
Loomis, J., 657	Marshall, J. W., 335	Penn, E. E., 1053	Sealy, W., 49	Vickers, V. G. R., 581
Lord, T. E., 49	Marshall, W., 335	Pepall, G., 15, 673, 765	Scully, J. J., 491, 579	Vliet, G., 955, 957
Lott, C., 301	Martin, A. W., 385	Pepper, G. F., 139	Seelye, R. Y., 863	Vosburgh, L. F., 221, 863, 865
Lord, F. W., 657	Martin, G. C., 49	Perry, R. E., 529	Sey, G., 139	W
Louden, A. C., 1053	Martin, T., 579	Perry, R. P., 715	Sewell, E. H., 191	Wagstaff, S. G., 15
Lovelock, W. E., 763, 953	Martin, T. E., 905	Peters, F. W., 191, 671	Shambrook, H. A., 223	Wainwright, W., 135, 139, 267
Lovett, H. A., 765	Martyn, F. G., 139, 837	Pettitt, S. C., 579	Shannon, S. L., 15	Walford, O. E., 1053
Lowe, F. W., 191	Mathews, W. D., 33, 133, 475	Phillips, W., 15, 385	Sharp, G., 475	Walker, A. P., 475, 863
Lumsden, H. D., 715	Maughan, W., 765	Phippen, F. H., K.C., 565, 615	Sharp, G. A., 953	Walker, F., 385
Lyle, A. L., 133	Maver, J. M., 301	Pierce, R. H., 33, 765	Sharp, S. J., 15, 219, 301	Walker, F. W. C., 477, 491
Lynch, P. J., 567, 581	Mead, C., 219	Piers, A., 33, 765	Sharpe, H. P., 905	Wallace, H., 133, 139
Lynch, W. J., 875	Meah, W. C. C., 219	Piggott, W. J., 567, 591	Shaughnessy, F., 381	Waller, G. E., 765
Lytle, A. C., 301, 431	Meighen, R., 293	Piggott, W. T., 501	Shaughnessy, Sir Thos., G. 33, 35, 133, 221, 295, 381, 565, 657, 765, 837, 953, 1039	Walsh, J. H., 335
M	Melanson, H. H., 673	Playfair, Jas., 657	Shaw, A. C., 1053	Walsh, S., 673
McAdam, R. A., 219	Mellen, C. S., 863	Plummer, C. H. F., 33, 133	Shaw, G. H., 905	Walton, Ernest, 35, 659, 673
McAnany, J., 671	Merriman, J., 765	Plummer, F., *503, 565	Shaw, J. R., 1039	Walton, G. A., 383, 385
McArthur, A., 763	Miles, H. R., 295	Plummer, J. H., 1039	Shea, R., 673	Walton, N. B., 763
McBain, D. R., 475, 491	Milhausen, J., 139	Polhamus, A. A., 671	Shearer, H., 765	Warner, F. D., 139
McCall, H., 763	Millard, C. J., 33	Poole, W. S., *521, 767	Sheehan, E. L., 491	Warren, F. W., 219
McCallum, H. M., 33	Miller, W. O., 301	Porteous, Wm., 615	Sheppard, J. S., 905	Warren, J. J., 1039
McCart, A., 863	Mills, Jas., 865	Porter, A. W., 219	Shewood, H. B., 335	Watson, F. J., 15
McConnell, W. H., 301	Mitchell, B. B., 139	Porter, F. R., 673	Shinnick, J. H., 139	Watson, J. R., 385
McCooe, D., 863	Mitchell, L. W., 671	Possnett, A., 1053	Shortt, A. T., 579	Watt, W. E., 491
McCormack, F. E., 581	Moffat, Jno., 953	Pottinger, D., 219, 837	Sims, H. B., 579, 659	Way, W. B., 615
McCormack, R. S., 865	Montgomery, C., 615	Powell, A. L., 671	Skinner, T., 953, 1039	Weatherstone, N., 475
McCormack, W. J., 139	Montgomery, G. A., 863, 955	Power, C. W., 673	Skinner, T. H., 565	Webber, W., 219, 431
McCormick, H., 1053	Montgomery, S. J., 33, 49	Power, T., 863	Smart, R. R., 579, 863	Webber, G. H., 15, 133
McCormick, R. S., 579, 650	Mooney, N., 139, 581	Pratt, G., 763	Smith, A. A., 863	Welch, F. P., 301
McCowan, A., 567, 579	Mooney, P., 267, 385	Pratt, W., 15	Smith, A. C., 33	Wells, G. C., 1053
McCulloch, A., 763	Moore, G., 33	Preston, R., 529	Smith, C. J., 191	Wells, W. J., 385
McDonald, D., 221, 431, 879, *1061, 1071	Moore, H. B., 565	Price, A., 295, 579, *705, 769, 1007	Smith, E. W., 267	Whalen, T., 955
McDonald, E., 491	Morris, J. W., 657	Price, E. D., 385	Smith, F. D., 1007	Wheatley, T., 673
McDonald, H., 49	Morrison, A. E., 765	Price, F., 431	Smith, H. E., 905	Wheaton, C. A., 579
McDonald, J. D., 477, 615	Morrow, Jno., 671	Price, W., 49	Smith, T. D., 579	Wheaton, L. H., 837
McFadden, P. H., 219, 957, 1039	Morse, F. W., 221, 295, 1041	Proctor, J. E., 385, 477	Smith, T. J., 301	Wheeler, C., 955
McFarlane, F., 579	Morton, J. D., 477, 491, 671	Proctzeller, H. W., 879	Smithers, A. W., 221, 289, 565, 657, 765, 953	White, A., 567
McGee, A. J., 15	Morton, J. R., 1053	Pullen, J., 15	Snell, W. H., 671	White, R. A., 219
McGillivray, J. A., 765, 905	Moth, G., 219, 765, 863	Pumphrey, J., 763	Sommerville, G., 191	White, T. H., 15
McGrath, J. I., 1007	Motta, G., 957	Purvis, A., 431	Soper, W. Y., 193	White, W., 673
McGuigan, F. H., 133	Mountain, G. A., 765	Pyke, J. W., 765, 953	Southall, G. F., 863	White, W., 673
McGuire, J. F., 385	Mount Stephen, Lord, 295	Pyne, R. A., 301	Spaldin, F. M., 905	White, Sir Wm. H., 301, 545
McHattie, T., 615, 953	Muhfeld, J. H., 1039	Q	Sparks, J., 905	Whitely, G., 763
McIninch, J. W., 49, 491	Muir, A., 673	Quick, J. E., *421, 477, 529	Spence, A. B., 673, 767, 837	Whitney, H. O., 863
McIntyre, A. N., 219, 671	Muir, J. D., 957, 1053	Quilty, J. P., 1039	Spencer, C. W., 95	Whittenberger, H. E., 905
McKay, J. M., 191	Muir, W. C., 671	Quinlan, D. J., 763	Spencer, G., 33	Whyte, W., 33, 295, 381, 579, 715
McKay, J. S., 955	Muirhead, R., 1039, 1053	Quinlan, M., 581	Spiering, R. H., 763	Wicksteed, H. K., 335
McKay, O., 191	Mulkern, L., 431, 565, 567, 579	R	Stackhouse, C., 1039	Wigren, E. A., 763
McKay, Hon. R., 1039	Mullins, A. Z., 673	Ramsay, C. W. P., 763	Stapleton, W., 385, 477	Wilcox, A., 49
McKean, A. T., 1007	Mullins, W. E., 615, 1039	Rand, N. L., 837	Starke, W. C., 673, 765	Wilcox, S. C., 529
McKenney, J. T., 865	Mundle, J. F., 715	Rankin, W. G., 579	Steele, D., 219	Wilgress, H. T., 763
McKinnon, J. A., 657	Munns, R. H., 657	Ranney, E. G., 763	Steele, J. R., 15	Wilkinson, F. A., 219, 301
McKinnon, J. H., 1053	Munro, C. A., 579	Ray, A. S., 301	Steeper, D. W., 1053	Williams, E. H., 863
McLaughlin, Jas., 1039	Munroe, W. I., 139	Reece, J. G., 491	Stephen, G., 529	Willson, T. L., 28
McLean, H. H., K.C., 953	Murphy, C., 866, 905, 955	Reed, Haytor, 33, 335	Stephens, C. E., 657	Wilson, J. H., 49
McLean, J. A., 1053	Murphy, D. J., Jr., 49	Reed, H. J., 491, 579	Stephens, Jas., 431	Wilson, R., 133
McLean, S. J., 431	Murphy, E. T., 139, 955	Reid, H. G., 221, 657, 837	Stevens, H. R., 219	Wilson, R. H., 49
McLeod, H. W., 381	Murphy, M. B., 491	Reid, J., 33	Stitt, W. D., 133, 475, 675	Wilson, R. H., 49
McLeod, K., 491	Murphy, M. G., 955	Reid, R. G., 657	Reford, R. W., 133	Wilson, R. H., 49
McLeod, M. H., 221	Murray, M. B., 715	Reid, W. D., 133, 475, 675	Reynolds, M. M., 133, 139	Wilson, W. S., 673
McLeod, W. K., 579	Murray, B. T., 863	Rice, H. E., 301	Rice, H. E., 301	Wood, D. O., 1007
McMicken, H. G., 1039	Murray, T., 863	Richardson, W., 765	Richardson, A. G., 385	Wood, W., 1007
McMillan, J. D., 581	N	Richardson, A. G., 385	Richardson, C. T., 715	Woodhouse, W. E., 301
McNab, J. G., 49	Naismith, P. L., 865	Richardson, C. T., 715	Richardson, J. F., 615	Woodsum, G., 219
McNab, J. V., 763, 765	Neilson, M., 335	Richardson, R. S., 267	Richardson, R. F., 1039	Woollatt, W., 267
McNabb, T., 95	Nelles, R. L., 33	Richardson, J. S., 267	Rindal, H., 133	Wright, E. J., 1053
McNabb, W. H., 863	Nelson, J. E., 219	Richardson, W. A., 491, 1039	Ritchie, W. A., 267	Wright, J. W., 957
McNeil, N., 49	Ness, J., 1053	Richardson, W. A., 491, 1039	Robb, W. D., 715	Wright, R., 381
McNeil, T., 863	Niblock, D. B., 381	Richardson, W. A., 491, 1039	Roberts, A. J., 219	Wyatt, G. H., 385
McNeillie, J. K., 95	Niblock, J., 381, 1007	Rindal, H., 133	Roberts, D. I., 431	Wyllie, G. B., 439, 837
McNeillie, R. G., 33, 385, 477, 529	Nicholls, F., 33, 905	Ritchie, W. A., 267	Roberts, W. E., 49	Y
McNicholl, G. A., 673	Nichols, T. H., 385	Robb, W. D., 715	Roberts, W. I., 431	Yeager, W. W., 1053
McNicol, D., 267	Nicholson, C. H., 35, 49, 77, 295, *405	Roberts, A. J., 219	Roberts, W. I., 431	Yeo, J., 335
McPhee, W. J., 579	Nicholson, M., 139	Roberts, D. E., 49	Robinson, A. H., 95	Young, H. A., 715
McPherson, C. E., 431, 957, 1041	Nickerson, C., 491	Robertson, J., 301, 671	Robinson, F., 863	Young, R. W., 671
McRae, G., 385	Nielson, R. M., 1053	Robinson, A. H., 95	Robinson, G. D., 1007	Young, Sir W. L., 475
McRae, T. W. R., 581	Nixon, W. J., 385	Robinson, F., 863		
	Norcross, J. W., 133	Robinson, G. D., 1007		

Articles marked with an asterisk are accompanied by maps, portraits or other illustrations

THE Railway and Marine World

With which are incorporated The Western World and
The Railway and Shipping World, Established 1890

Devoted to Steam and Electric Railway, Marine, Grain Elevator, Express, Telegraph,
Telephone and Contractors' interests

Old Series, No. 225.
New Series, No. 143.

TORONTO, CANADA, JANUARY, 1910.

For Subscription Rates,
See page 41.

Steel Freight Cars.

By W. S. Atwood, Mechanical Engineer,
Dominion Car and Foundry Co.

The subject of steel freight cars is one which may at present time be considered a live one in Canada and a very important one among those interested in the designing, handling, and maintenance of railway freight cars. Steel cars have long since passed the experimental stage, and have demonstrated conclusively their superiority and desirability, and the Canadian railways are, therefore, specifying each succeeding year a greater proportion of their requirements to be of all-steel or steel underframe construction. The introduction of all-steel or steel frame cars on the American continent is comparatively recent, the first of the modern steel cars being built about 1897, yet we have records of steel cars being built in limited quantities as early as 1853 in America, and in much larger quantities a few years later on the European continent, the Eastern Ry. of France alone having in 1905 over 20,000 cars, with metal framing or all-metal construction, in service. During 1907, which represented a healthy condition in the car building industry, the returns from 36 car building concerns in the United States and Canada show 284,188 freight cars built, of which 72% were of all-steel or steel underframe construction. This proportion of steel cars to wooden cars built seems remarkable when one considers the comparatively short time since their introduction, and is very convincing evidence that they have demonstrated their superiority over the wooden cars.

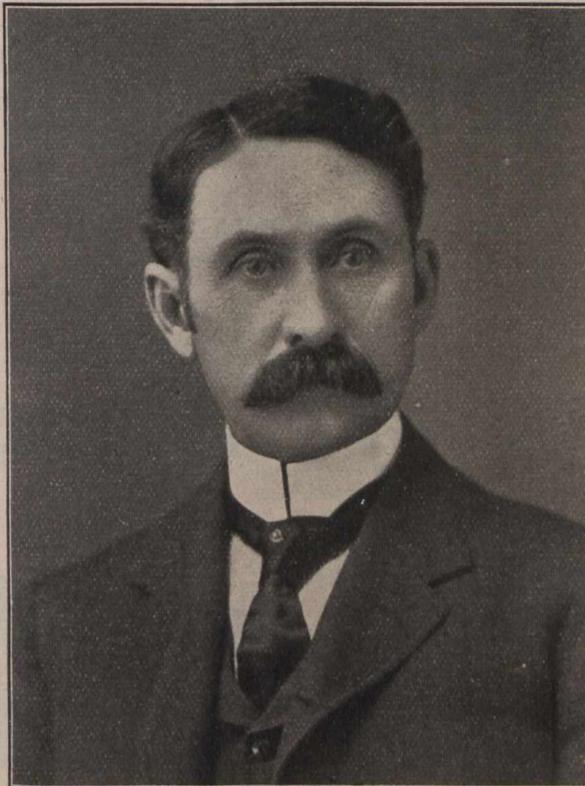
DESIGN.—The designing of the modern all-steel and steel frame cars has been left, in large measure, to the car builders themselves, in conjunction with and often under the supervision of railway officials, due to the fact that this type of construction was new, and it was necessary for the steel car builders to design and illustrate to the railroads the many advantages to be gained in substituting steel for wood in car construction. How well they have succeeded, as well as the proof of their assertions, is shown by the figures just referred to, as well as other figures given in the numerous articles appearing in the press during the last few years. Some of the larger systems have, however, taken up the designing of their steel car equipment on quite an extensive scale, and not only furnish the builders with complete specifications, but complete detail drawings and bills of material, and insist on the cars being built in accordance with them. Both arrangements have their advantages and disadvantages.

In the case of the railways designing their own cars they are able to standardize their castings, forgings, and miscellaneous parts to some considerable extent, and, by keeping in mind their standard cars of different classes, are often able to design them in such manner as to have several parts common to all classes, thereby helping to reduce the investment for spare parts, as well as making substitutions easily. This, however, often works out to the disadvantage

important item to be taken into consideration in estimating and designing, and the number of complicated shapes should, therefore, be kept as low as possible. And particular attention should be paid to standardizing all castings and such forgings as might be termed the moving parts, such as brake gear, draft gear, etc., which are more liable to damage and need renewal at repair points.

Too much cannot be said in favor of standard parts, and while the Master Car Builders' Association has accomplished admirable results in the way of standard truck parts and wooden car body parts, they have, as yet, done little towards standardizing construction for steel car bodies. It would also seem as though the railways could do a great deal along this line to cheapen the building of freight cars, and it has often occurred to me that an ideal arrangement would be possible, in Canada at least, if the railways could each appoint representatives to assemble and decide on a standard construction for each class and capacity of freight cars, and have standard specifications and drawings, in so far as general dimensions, arrangement of framing, unit fibre stress, etc., are concerned, which would be common to all the railways. A representative from the leading car building firms, and perhaps a representative from the Railway Commission, could be included if considered advisable, the idea being to decide on the best possible construction, keeping in mind the building and maintenance cost. Any improvements suggesting themselves from time to time could be considered by this committee, and, if found advisable, would be adopted on all roads and incorporated in the standards. This standardizing is carried out extensively and advantageously on some of the largest railway systems, so, why not go farther and include all railways? This, no doubt, would be considered by many as an impossible task, but the advantage that would be gained and the money that could be saved would certainly warrant a considerable outlay in establishing such a system. In fact, after all things are considered, each railway company's cars are in operation accomplishing practically the same results, the differing details being more or less an expression of personal opinion and experience, and it would seem as though the spirit of give-and-take could prevail, creating a practical standard which would be satisfactory to all. This, of course, would apply to the more common types which are more numerous, and not to the few special types designed for special service.

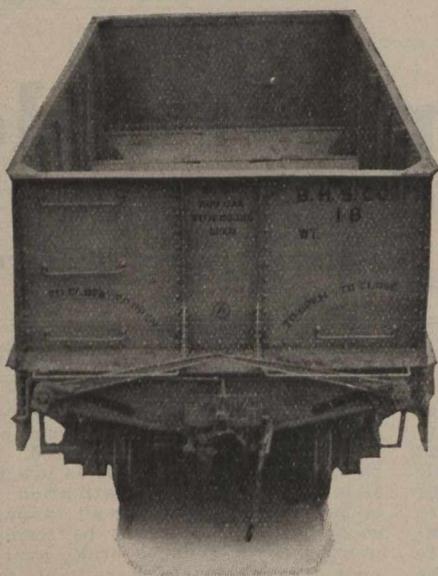
Notwithstanding the claims made as to



F. CONWAY.

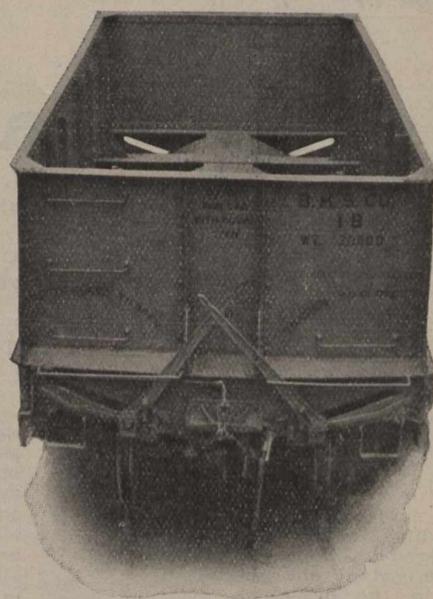
Acting General Superintendent and General Freight and Passenger
Agent, Kingston and Pembroke Railway.

of the builders, as they, too, have their standard dies, patterns, etc., which, of course, are to their advantage to use, but which may differ from the railway company's standard just enough to necessitate new dies and patterns to such an extent that the saving gained in having the drawings, specifications, and bills of material furnished is more than offset by the die and pattern cost. These dies may never be used on later orders, which means, of course, that the entire die and pattern cost would have to be borne by this particular lot. In the case of large orders this cost, distributed over the entire lot, would, of course, not represent as important a charge per car as in the case of small orders, but it is an



Top View Doors Closed

OTIS DUMP CAR



Top View Doors Open

WE MAKE A SPECIALTY
OF
DROP BOTTOM

- COAL CARS
- ORE CARS
- BALLAST CARS
- STOCK CARS
- BOX CARS
- FLAT CARS

FOR
SAND
ORE
STONE
AND
GRAVEL

OF
ALL WOOD, ALL STEEL
and COMPOSITE (Steel
and
Wood) CONSTRUCTION.
WITH
Capacities from
10 TONS to 55 TONS
ALSO
SPECIAL DESIGNS FOR
SPECIAL CONDITIONS



Side Elevation Doors Closed



Side Elevation Doors Open

THE HART-OTIS CAR CO. LIMITED
MONTREAL

the indestructibility of steel cars, the question of repairs is still a very important consideration in designing them; in fact, it might be called the all-important one, with the possible exception of strength. On some of the first steel cars built there were several details which developed weaknesses in service, but, owing to the manner in which this subject has been taken up, these defects have all been remedied and the steel cars as now proportioned are withstanding the service to which they are put.

The proportioning of the longitudinal sills for the vertical load is an important question in designing, and one which has been the cause of frequent discussions; some advocate proportioning the sills for an evenly-distributed load, while others consider it necessary to figure for concentrated loads. A large number of designers and car builders favor the assumption that it is perfectly safe to take the maximum load carried by the sills and assume it as evenly distributed, and keeping the fibre stress within reasonable limits. For the rare cases of concentrated loads in service the metal would not be strained beyond its elastic limit, as it would be taken care of by the low fibre stress, and it would hardly seem economical to provide for a heavy concentrated load with low fibre stress, when the usual condition would be a distributed load which would only produce a portion of the fibre stress provided for, in figuring concentrated loading.

It is also an open question as to how the sills should be proportioned in relation to each other, viz., as to whether the centre sills should carry all the load, the centre side and centre should each carry their portion, and, in the case of the cars requiring sides for containing the lading, whether these sides should also act as a plate girder and carry all the load. The usual method followed for flat cars is to design them having deep centre sills proportioned to carry all the load, and a rolled section for side sill figured as a continuous beam, supported at the bolsters and top cross-bearers, and carrying only that portion of the load distributed along the sides of the car. For gondola and such cars as require sides for containing the lading, and which usually consist of a web plate and with top and bottom flange angles, it is, of course, the most economical construction to figure them as complete girders and proportion them to carry the entire load, keeping in mind to provide for lateral stiffeners to contain the lading, and prevent the girder from buckling. The centre sill would then be proportioned for the buffing shocks only. The severity of the buffing shocks to provide for is usually specified by the railway, and is simply a question of how safe they wish to make the cars in this respect, and whether they are willing to stand the extra expense of providing for the more excessive shocks recorded in recent dynamometer tests. This construction usually works out the cheapest, but would, of course, not apply to box cars with wood-frame superstructure. In this case the framing should not be depended upon to carry any of the load, on account of its becoming loose due to wood drying out, nuts on the frame rods becoming loose, etc. It would, apply, however, where the side frames are of steel, securely riveted to the side sill at the bottom and to a member forming the side plate at the top, thereby constituting an open truss between the bolsters. In proportioning the side frame, however, to carry a portion or all of the vertical load, account should, of course, be taken of the bulging stress in the members due to the loading.

The splicing of the centre sills in front of the bolster to facilitate repairs is a detail which has been the source of many arguments, but a large number of master car builders now contend that, if the sills are made proportionately stronger at and between the bolsters than they are be-

tween the bolster and the end sill, any stress great enough to damage the sills would do the damage where they could be easily gotten at and cut off and spliced if necessary, and that the cost of doing this in the small number of cases required would not be nearly as great as the additional cost of making the splice on all the cars at the time of building.

The diagonal brace, which is usually put in all underframes at the corners, is a detail which varies according to the ideas of the designer or master car builder. Some advocate extending it from the ends of the centre sills to the intersection of the side sill and bolster, arguing that it relieves the centre sills of a portion of the buffing shocks, transmitting same to the sides; also that any cornering of the car sufficient to damage it to any extent would also be great enough to damage the brace if it was extending from the corner of the car to the intersection of the centre sill and bolster, and without the brace at the corner the underframe is much easier repaired. It would seem good practice however, to extend the brace from the intersection of the centre sill and bolster to the corner of the car, bracing the corner against ordinary cornering shocks, and to always take care of the buffing shock in the centre sills.

On some of the early types of cars one can notice both sides and ends have bulged out, due to the lading, but more particularly the ends, due to the shifting of the lading, on account of rough handling of the cars. This has now been overcome by the use of horizontal end braces, extending the entire width of the car and being tied securely to the sides, in place of the former vertical end stakes. The sides have also been strengthened, some using an inside pressed flange stake tapering towards the top in the form of a gusset, which is, no doubt, the strongest form of stake when securely fastened at the bottom, but has the objection of decreasing the available space for lading when the car is being used for handling long material. One common cause of damage to the sides of coal cars is the mechanical unloader, and it would seem as though some improvement could be made in the manner of gripping the car sides to distribute the load over a larger area.

The proportioning of the bolsters and cross-bearers depends, of course, to a large extent, as to how the vertical load is distributed and carried by the sills, thereby determining how much load is to be carried to the centre through these members. The fact of the possibility of having to raise the car while under load, by placing jacks at the extreme ends of the body bolsters, should not be overlooked. One of the most important details in the bolster construction is the centre brace between the centre sills, directly over the centre plate. On some of the early cars it was customary to use rather light pressed diaphragms, and one can see a number of these cars with the bolster bottom plate bowed up between the sills sufficient to allow the side bearing clearance to be taken up. This, however, is well taken care of by substituting a substantial malleable-iron or cast-steel casting, securely riveted to the centre sills and having a good bearing on the bolster plate. This especially applies to cars having a body centre plate of small diameter, and where the load on the centre plate is transmitted to the centre sills by the bolster centre brace.

At the time of the introduction of the modern steel cars the matter of weight received considerable attention, as one of the leading arguments in favor of them was the greater ratio of paying load to dead weight, and on this account some parts were designed too light, so that the same class of car as built to-day is considerably heavier. The important question among railway officials at present is, is the car designed strong enough to withstand the service for which it is

intended and keep off the repair tracks, as the cost of moving the small additional dead weight is more than offset by its decreased maintenance cost and the increased earnings, by reason of its continuous service?

CORROSION AND PAINTING.—A great deal has been said on the subject of painting steel cars, some roads going into this phase quite extensively, while others give it less consideration, arguing that the corrosion can in most cases be neglected, and paint for appearance only. It would seem, however, that the car should not only be well protected with paint at the time of building, but should be repainted as often as the service which the cars are in would require. Up to the present time, however, where the cars are kept in service there has been no serious effect from corrosion, except, perhaps, under some extraordinary conditions, and while in a badly corroded steel plate it is possible to chip off quite a thick scale, it does not, of course, follow that the plate is decreased in thickness an amount equal to the thickness of the removed scale. The 12 years which steel cars have been in service in this country have not been sufficient to determine accurately the percentage of loss in section due to corrosion, as it has not taken place to any appreciable extent, except, perhaps, in some floor sheets in cars loaded with coal and similar material, when allowed to stand idle, particularly when wet. So that the report of Mr. Tolmar, chief of shops on the Eastern Ry. of France, who has had experience with steel cars since 1861, is very interesting, and shows conclusively that the corrosion of steel cars is not a consideration of consequence. Mr. Tolmar found that steel frame cars showed the following proportion of loss in section from corrosion:—

Cars built in	Life.	Loss in p.c.
1869	27 years.	3%
1874	22 years.	4%
1875	21 years.	3.18%

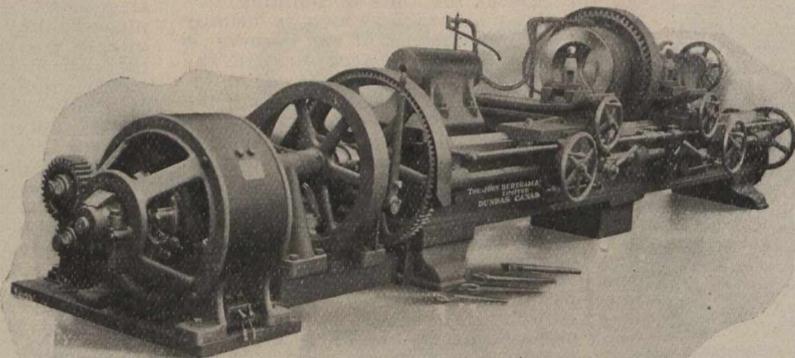
From the above, it will be noted that a piece of steel one-quarter inch in thickness would, after 27 years of service, be reduced in thickness by a little less than one sixty-fourth inch, so that, if, as usual, the cars are given a very small amount of attention in the way of repainting, and are kept in service and not allowed to stand for long periods of time, the matter of corrosion can be practically neglected.

REPAIRS.—The ease with which steel cars have been repaired and maintained with a few very simple tools and facilities has probably been one of the main reasons for their adoption. Some years ago it was thought by many that the repairing of steel cars was going to be a serious problem, and would have to be done by expensive skilled labor, but, instead one has only to walk through some of the large repair yards, and notice the regular wood car repair gangs working either on wood or steel car repairs, to be convinced that the wood car repair men handle the steel car equally as well as the wood car, and that there is no need of additional skilled labor. In fact, in building steel cars highly-trained mechanics are not required, so it would hardly seem necessary to use more expensive labor to repair them. Not only can the steel car be as easily repaired, but the cost of the repairs are much less. This saving, of course, varies with the different companies and different classes of cars, but it has been conservatively estimated that the cost of running repairs to steel cars is at least 30% less than for wooden cars, with the additional advantage of being on the repair tracks a fewer number of times, and instead of there being from 2 to 4%, or, in some cases, as high as 7%, of the cars out of service for repairs as with wooden cars, the number of steel cars out of service for repairs is nearer one-half of 1%.

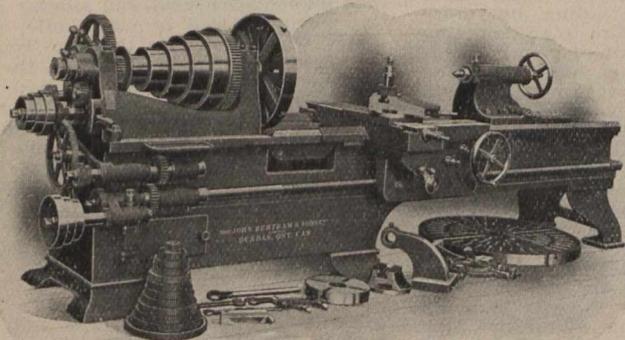
One could give a large volume of fig-



BERTRAM MACHINE TOOLS



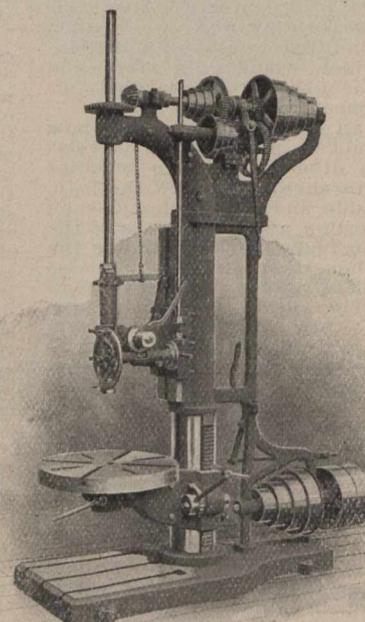
BERTRAM NO. 3 DOUBLE CAR AXLE LATHE Motor Driven



BERTRAM 40-24 INCH STANDARD GAP LATHE

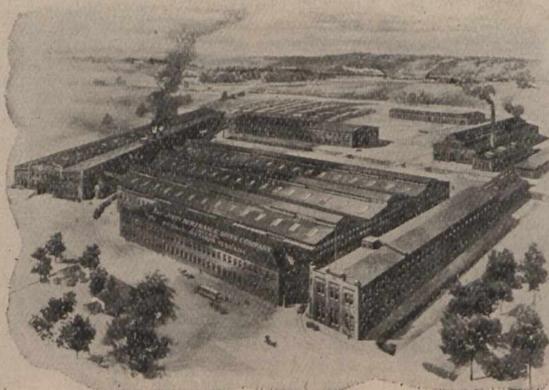
Engine and Gap Lathes, Hammers, Planers and Vertical Drilling Machines of various sizes for prompt delivery.

Particulars sent on request.



BERTRAM 30 Inch VERTICAL DRILL
Built in 20 to 45 inch sizes

**Manufacturers of
General Machine
Shop Tools of
every description.**



**Hydraulic, Rail-
way, Shipyard and
Bridge and Boiler
Shop Machinery.**

THE JOHN BERTRAM & SONS CO., LIMITED

DUNDAS, ONTARIO, CANADA

SELLING AGENTS—The Canadian Fairbanks Company Limited

OFFICES: Montreal Toronto Winnipeg Vancouver Calgary St. John

ures showing these advantages, but it would only be repeating what has already appeared in all the leading journals in the past few years. As a fair representation, I will refer slightly to an article appearing in the American Engineer, of October, 1908, written by G. E. Carson, who was at the time of writing the article with the P. & L.E. Ry., which road was among the first to adopt steel cars, and which has nearly 60% of its equipment all-steel. Mr. Carson states as follows:—

"A very accurate record was kept of the average number of times the different classes of cars were called into the shop for light, medium, and heavy repairs, covering a period of one year.

"Average number of times one wooden coal car was in the shop during one year..... 7 times.

"Average cost of repairs each time in shop \$16.23

"Average number of times one wooden coke car was in the shop during one year 6 times.

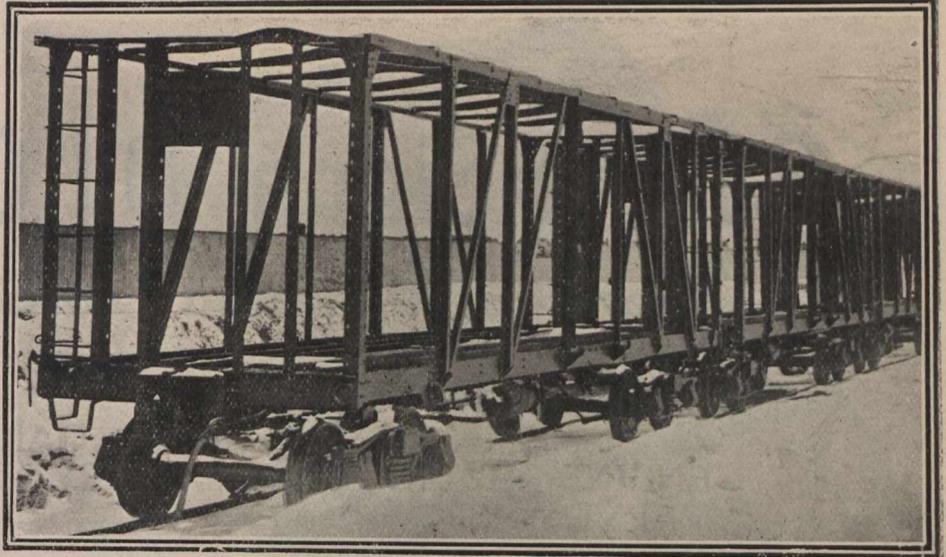
"Average cost of repairs each time in shop \$10.74

"Average number of times one steel car was in the shop during one year 1½ times.

"Average cost of repairs each time in shop \$6.74."

The above figures, Mr. Carson states, are the cost of material and labor less scrap credit, and show average cost of the total light, medium, and heavy repairs to 11,338 steel cars and 32,070 wooden cars. Adding the above amounts for the wooden car together, and averaging same would show the saving in cost of repairs in favor of the steel car of \$5.74, or a saving of over 42% in cost, and also showing that the wooden car was on the repair track five times as often as the steel car, which, in itself, is an item of considerable consequence, especially in times of car shortage.

LIFE OF STEEL CARS.—Owing to the modern steel cars having only been in general use since about 1897 and 1898, and their still being in such good condition, it would be difficult to state accurately the life of steel cars, and same can only be estimated principally from the experience of the companies in the old country, who have had steel cars in use long enough to enable them to ascertain the life more definitely. From this information, and also from what experience has been had in this country with the steel cars, it has been conservatively estimated that the life of steel cars is from one and a half to two times that of the wooden cars, and that during the life of the cars the repairs to the body of the steel cars would be considerably less than those to the body of the wooden cars. In fact, the steel car bodies are practically indestructible, and the estimate of twice the life of a wooden



CANADIAN PACIFIC RAILWAY STEEL FRAME BOX CARS. Photographed before the wooden lining was put on.

car would seem to be very conservative, when one considers the small number of steel cars which have been destroyed since their adoption. In this connection one might refer to the American Engineer, of March, 1909, in which it was stated that on the Pennsylvania Rd., which had then 47,775 all-steel cars in service, 1,075 of which had been in use since 1898, only seven cars had been destroyed. Two of these cars were lost in a flood in Kansas, and most of the others were destroyed on foreign lines.

The foregoing paper was read before the Canadian Railway Club recently.

C.P.R. Steel Frame Box Cars.

The C.P.R. has had built by the Dominion Car & Foundry Co. 500 box cars which are somewhat different from the usual type, as the frame, including the carlins, is entirely of steel, and is only sheathed on the inside, or in other words, the car has only a single course of lining on the inside of the frame, the lining being 1¼" thick both on the sides and ends. This 1¼" lining is bolted to the members of the steel frame, as shown in the accompanying illustration, with ½" bolts, the holes for the bolts through the steel frame being slotted, in order that in case the lining should shrink sufficient to develop cracks between the planks, they can be pulled together by means of a strap rod, which extends up and hooks

over the top board, the bottom end being forged round and extending through the steel side sill, and which is threaded for a nut, and as the lining extends up and overlaps the side plate about 3", the boards can be drawn down this distance before any opening would be left between the top and side plates. This, of course, is much in excess of anything that would ever be required. These cars, however, have now been in service for a considerable length of time, and no serious trouble has been experienced along this line, with the exception of a few cars in which the lining was not very dry, and which therefore were required to have the sides drawn down and tightened by means of the rod referred to.

The underframe of these cars is of the usual design, and consists of standard 15" channels with ¼" cover plate, the side sills of 8" channels and the end sills of 10" channels. The bolsters and cross bearers are the built up type with pressed diaphragms, and top and bottom cover plate. The floor supports are composed of Z bars in place of the usual wood stringers, and the floor is bolted to same. The framing of the cars is quite clearly shown in the illustrations, the side members being made of standard 3" Z bars. The corner posts are 5 5 angle iron. The end framing, it will be noticed, is of unusually strong design, the two centre posts being composed of 4" Z bars and the intermediate posts of 3" Z bars, which extended down back of, and are securely riveted to, the end sills. To these posts, of course, is bolted the 1¼" lining which taken altogether makes an unusually strong construction. The roof of the cars above the pressed steel carlins is of the usual construction. These cars conform to the American Railway Association standard dimensions, being 46 ft. long inside, 8½ ft. wide, and 8 ft. high, with 5 ft. door opening.

On account of the lining being on the inside of the frame, these cars present a very smooth interior, and they are particularly adapted for grain service. Since having been in service, they have been watched carefully by the C.P.R. officials, who are so well satisfied with them that they have placed an additional order with the Dominion Car & Foundry Co. for 1,000 more.



CANADIAN PACIFIC RAILWAY STEEL FRAME BOX CAR

Letters patent were issued in Sept., 1909, covering railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, respecting C.P.R. grants of 571.24 acres.

Galena-Signal Oil Company

Franklin, Pa., and Toronto, Ont.

Sole manufacturers of the celebrated GALENA COACH, ENGINE and CAR OILS, and SIBLEY'S PERFECTION VALVE and SIGNAL OILS.

GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

Maintain EXPERT DEPARTMENT, which is an organization of skilled railway mechanics of wide and varied experience. Services of Experts furnished free of charge to patrons interested in the economical use of oils.

STREET RAILWAY LUBRICATION A SPECIALTY

Galena Railway Safety Oil

Made especially for use in Headlights, Cab, Classification and Tail-lights, and for Switch and Semaphore Lamps. Burns equally well with the long time as with the one day burner, with or without chimney, as the burner requires.

Is pure water white in color; high fire test; low cold test, and splendid gravity.

Please write to home office for further particulars.

CHARLES MILLER,

PRESIDENT

MAINTENANCE REGULATION CARDS

By R. W. Burnett, General Master Car Builder, C.P.R.

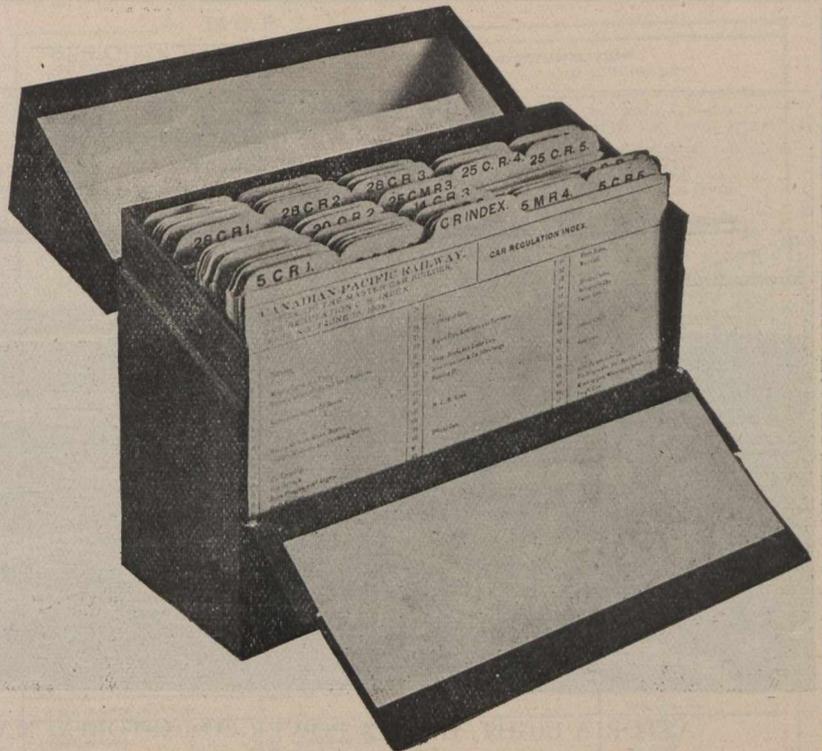
In the operation of a railway one matter of prime importance in all departments is the issuing of instructions in such a clear and concise manner that there will be no misinterpretation by those who have to be guided by them, and to the extent that they are clearly understood largely depends the efficiency of any department. Instructions as to maintenance of equipment, standards, shop practice, etc., have been issued in various ways. The M.C.B. Book of Rules, for what it is intended, is complete and indispensable. Instructions on certain subjects, such as air brakes, steam heat, etc., are to a large extent issued in book form. Other instructions are contained in blue prints.

Aside from the instructions issued by the methods above mentioned, there is a field which has to be covered in a more direct way, and in the past this has largely been done by circular letters. The preparation of circular letters consumes a great amount of time and study, to prevent conflicting instructions being issued. This time is consumed by the head of the department or most valuable members of the staff, in reading former instructions and checking the various points covered to make certain that the letter to be issued covers the subject in a clear manner, and that all letters issued, subsequent to the original, modifying or cancelling portions thereof, are taken into consideration. This is sometimes impossible by reason of the number of former issues and multiplicity of duties of the person who has the responsibility. This naturally results in letters being hurriedly prepared partially covering a subject, with the feeling that omissions or inaccuracies can be corrected by subsequent letters. These are also often issued to persons not in active touch with details, and to persons in other departments who should have the information, but who do not have the time or the assistance available to go through the file and arrive at what the present practices are. They, therefore, do not constitute the ready reference which such persons should have.

I might at this point mention some of the difficulties met with in depending too much on blue prints for every-day reference. A station of sufficient importance to warrant an office staff, that can keep the prints properly filed, may keep them in reasonably good shape, but there are a large number of men whose facilities for filing prints is limited by the available wall space for framing and hanging. Furthermore, blue prints or folios of pattern numbers contain a vast amount of information which is useful only as a matter of record. What the man doing the work requires is condensed information relative to parts liable to failure, instructions as to how, and under what conditions, repairs or betterments are to be made, materials to be used, and drawings to be followed.

The filing of circular letters is a difficult problem. In an office where there is a sufficient staff to properly attend to the filing any letter may be located quickly, but with the foremen and inspectors, who are the men depended upon to make daily use of the instructions and for whom they are really intended, it is different. Some men may place them in books or in files that may be provided, others will place them in the most convenient drawer, or on hooks, but, in search of information, we have too often discovered that there are missing links. Even with the most modern filing systems a considerable time is often necessary to arrive at a correct understanding of what constitutes the up-to-date instructions on any one subject. It is often impossible to ascertain this in any reasonable time, owing to overlapping, conflicting, or apparently conflicting, letters having been previously issued. This may result in arguments between various persons as to the proper interpretation, or they are left in doubt for indefinite periods as to the meaning intended, the result being different practices at different points.

As a substitute for and improvement on the circular letter system, we have instituted a system of issuing instructions by cards, which we call "Maintenance Regulation Cards." To distinguish between the car and locomotive department, those pertaining to car work are called "C. R." cards, meaning "Car Regulation," and those pertaining to motive power "M. R.," meaning "Motive Power Regulation." The use of these cards has been developed by evolution. In the earlier stages they were used only to give direct instructions relative to standards, materials to be used (such as paint for the various classes of freight equipment), giving drawing numbers, or such



5 C R 1.

CANADIAN PACIFIC RAILWAY OFFICE OF THE MASTER CAR BUILDER CAR REGULATION 5 C R 1 ISSUE NO. 2 JUNE 16, 1908.		PRESSURES FOR APPLYING WHEELS TO AXLES	
FOR TENDER AND CAR AXLES			
SIZE OF JOURNAL	STANDARD DIAMETER OF WHEEL FIT	PRESSURE FOR MOUNTING	
		CAST IRON WHEELS	STEEL TYRED WHEELS
3 3/4" x 7"	8 1/8"	30 TO 40 TONS	48 TO 55 TONS
4 1/4" x 8"	8 3/4"	33 TO 42 TONS	50 TO 60 TONS
5" x 9"	8 1/2"	40 TO 50 TONS	60 TO 70 TONS
5 1/2" x 10"	7"	45 TO 55 TONS	65 TO 75 TONS

67 C. R. 1.

CANADIAN PACIFIC RAILWAY. OFFICE OF THE GENERAL MASTER CAR BUILDER CAR REGULATION 67 C R 1 ISSUE NO. 1, SEPTEMBER 8, 1909.		INSTRUCTIONS GOVERNING THE REPORTING, REPAIRING, CONDEMNING ETC., OF CARS DAMAGED IN WRECKS, OR GENERAL DELAPIDATED CONDITION DUE TO AGE, WEAR AND TEAR ETC.
<ol style="list-style-type: none"> 1. As soon as possible after arriving at wreck the foreman in charge will wire the Gen. M. C. B., Gen. Supt. and such other officials as he requires, giving initial number or name of each car damaged, with estimated cost to repair, and cause of wreck. 2. When wreck has been picked up the foreman in charge will fill out and send to the Gen. M. C. B. at Montreal on first train Form M. C. B. 89. The estimate on this form may vary from the telegraph report as more complete inspection may make necessary. 3. Divisional Car Foreman in all cases must be notified by wire of wrecks and should make every effort to get to serious wrecks to take general charge and prevent unnecessary damage to equipment. 4. Precautions must be taken in lifting or rolling passenger cars to prevent damage to the frame, roof or sheathing by crushing or twisting, or slipping of ropes or cables due to improper hitching. 5. (a) Wooden flat, Ballast, or Coal cars of 30 ton capacity or over must not be burned or otherwise destroyed under any circumstances, but when badly damaged loaded on flat cars and shipped to point designated by the M. C. B. for repairs. (b) Wooden cars of 30-ton capacity and over, other than flat or coal should not be burned unless the car is in two pieces and cannot be picked up and run on trucks, and then should be burned only with the consent of the Divisional Car Foreman, who should make every effort to make personal inspection. (c) Cars of less than 30 ton capacity may be destroyed when damaged to the extent of \$100.00 or more unless equipped with metal roofs in which case they should be treated as cars of higher capacity. (d) Steel cars, or cars with steel underframes must never be reported as destroyed except on authority from the Gen. M. C. B. 6. No cars will be condemned other than cars destroyed in wreck as covered by paragraph No. 5 without submitting Form 25, and receiving authority from the Gen. M. C. B. 7. All cars destroyed must be reported to the Gen. M. C. B. on Form M. C. B. No. 15. (a) Cars taken from revenue service to use as boarding cars must be selected by the Divisional Car Foreman and approved by the Gen. M. C. B. (b) Cars must not be taken for boarding car service that are equipped with metal roofs. 8. Cars that are to be burned at wreck or when otherwise condemned, that are equipped with metal roofs must have serviceable roofs or parts of roof carefully removed and kept for further use, and when destroyed at repair points, purines, carlins, rafters etc. should be kept as far as practicable, to avoid using new material. 10. All cars that are burned should first have couplers, springs, air brake equipment and serviceable side doors removed. 		



ASTORIA LIGHT, HEAT & POWER CO., ASTORIA, N.Y., SHOWING BRIDGE TRAMWAY.

THE BROWN HOISTING MACHINERY CO.

Engineers, designers and builders of hoisting machinery of all descriptions.

Write us stating your requirements and ask for catalogues.

Main Office and Works:

CLEVELAND, OHIO

Branch Offices:

PITTSBURG AND NEW YORK

instructions as pressures to be used in mounting various sizes of wheels, etc. But, as the cards were issued, the possibilities of the scope for which they could be used became more and more apparent. In a short time cards were prepared giving in detail instructions covering certain subjects, containing drawing, pattern, and form numbers, stating under what conditions betterments could be made, naming stations that would do the work, and the amount of work expected at various stations, and in many cases saying what not to do and advising how report of work should be made.

The method of preparing these cards varies. The usual procedure is to originate them in the general office, by making a preliminary draft of the proposed card, covering the subject as completely as possible, and giving copies to one or more members of the staff, or to foremen particularly interested, for criticisms and suggestions, after which all papers are turned over to one of the staff to compare with previous instructions and rewrite. The card is then given to the Chief Draughtsman to be checked for accuracy as to drawing, pattern, and form numbers and dimensions. Copies are then sent to the heads of the departments interested, who in turn refer them to their staff for suggestions and criticisms. The card is then finally approved and proof-printed, proof is checked up, and necessary number printed. If necessary, extracts of the proposed card are sent out for the guidance of the foremen, pending the final approval and issuing of the card. The Chief Draughtsman is asked to prepare cards which consist principally of data that would be furnished by the drawing-room. Various other members of the staff are called upon to make drafts of proposed cards on subjects with which they are in close touch. In some cases a local foreman may be asked to prepare a card on some practice that he has developed, or which has necessarily been carried on more largely at his station than at other points. It does not necessarily follow, however, that it is always advisable to assign the preparing of cards to the persons most intimately acquainted with the subject, as some men, owing to close application to other duties, may get out of touch with a certain subject, but when it is necessary for them to prepare a card on same they are forced to familiarize themselves with all the details in a way not likely to be forgotten. Considering the manner in which these cards are prepared, which gives so many of the staff an opportunity to make suggestions and criticisms, it may be said that, to a large extent, foremen are carrying out their own instructions. We invite suggestions as to the subjects that should be covered by cards, and at divisional car foremen's meetings the drafts of the proposed cards are criticized and suggestions considered, also propositions are made as to the issuing of cards on subjects requiring definite instructions, sometimes accompanied by draft of proposed card. This combines the practical side of the subject, as seen by the men actually handling the work, with such necessary data and further instructions as may be furnished by the office.

The cards are given the same index number used for correspondence. The index number of wheels, tires, and trucks is 5, and the first card on any of these subjects would be 5-C. R. 1, and the second 5-C. R. 2. One card has been issued showing the index numbers and the subjects they cover. A card is issued quarterly showing the active cards, giving the index number of each, subject covered, issue number and date, by which all on the mailing list are enabled to check their file, and should they be short of any, they are supplied upon request.

In the beginning we had a mailing list, each person on the list receiving a copy of each card printed. Some of the persons on this mailing list received a stated number of each card printed, to supply their different foremen. We have since found it necessary to issue in a different manner, and one card is printed on which the persons to whom certain cards are to be furnished are designated by symbol letters, as it has been found that, instead of confusing the foreman with a large number of cards on subjects in which he is not interested, he should receive only such as pertain to the work that he handles. Heads of departments on this list receive a copy of each card issued, and are designated by symbol letter "A"; others, such as assistant foremen, receive only such as pertain to their work. The symbol indicating to whom they will be sent is printed on the card. The cards pertaining to wheel-mounting, tire-turning, etc., are mounted in a frame and placed in a conspicuous place in the wheel shop. Cards pertaining to air brake work are mounted in a frame and placed in a conspicuous place in the air brake room.

14 C. R. 2.

<p>CANADIAN PACIFIC RAILWAY OFFICE OF THE MASTER CAR BUILDER CAR REGULATION 14 C. R. 2 ISSUE NO. 2, APRIL 1, 1909.</p>	<p>METHODS OF FUMIGATION "THOROUGH" AND "ORDINARY"</p>
<p>THOROUGH FUMIGATION</p>	
<ol style="list-style-type: none"> 1. Fumigation should be done before the carpet or anything in car is removed, or cleaning is begun. 2. Close all outside doors, windows, deck sash and ventilators tight and pack all lamp jacks and similar jacks tightly with waste from the outside. 3. Open all interior doors and RAISE CLOSET SEATS. If car has dry hoppers stop up chutes at bottom. 4. Pull seats forward and loosen pillows in pillow boxes. 5. Open upper berth and lay headboards across the seats so that one corner rests upon a seat arm. 6. Lay lower mattress on the headboard with middle arched upwards, by placing the ends together. 7. Raise curtain poles and hang curtains near the ends by a single hook. 8. Throw blankets over curtain poles, making as few folds and thicknesses of cloth as possible. 9. Arch the upper mattresses in the berths. 10. Soiled linen in the lockers must be pulled out and scattered in passage. <p>NOTE. It is necessary to make the greatest possible surface exposure of the contents of the car, so as to ensure the best results.</p> <ol style="list-style-type: none"> 11. After car has been prepared for fumigation as above, place 3 galvanized iron pails per Dwg. No 4896 1-6 in the aisle of the car, one in each end, and one in the middle. In each pail place 1 lb. of Permanganate of Potash and 1 pint of Formaldehyde. 12. After placing pails in position, cars must be closed and locked, and left for at least 3 hours, after which time thorough ventilation will be necessary. Pails should be removed soon after opening car to hasten ventilation. 13. In ventilating the car, open all windows, and deck sash when weather will permit. <p>The ventilation usually requires about 3 hours before car is in condition to receive passengers.</p>	
<p>ORDINARY FUMIGATION</p>	
<ol style="list-style-type: none"> 1. Make the car as nearly air tight as possible by closing all deck sash, windows, ventilators and other openings. 2. Open all inside doors, berths and lockers and raise closet seats. If car has dry hoppers stop up chutes at the bottom. 3. Prepare Formaldehyde as in "thorough" fumigation, except that only 1 pail containing one lb. of Formaldehyde will be used, placing the pail in the aisle, in the centre of the car. 4. Close and lock car, and leave closed for 1-2 hrs. as ventilated as thoroughly and quickly as possible or longer if time will permit, after which car should be ventilated as in "thorough" fumigation. 	

28 C. R. 4.

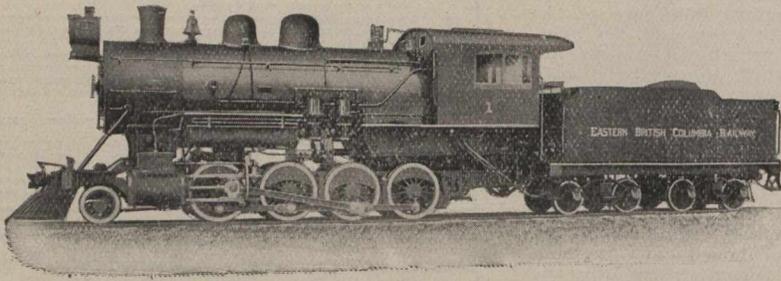
<p>CANADIAN PACIFIC RAILWAY OFFICE OF THE MASTER CAR BUILDER. CAR REGULATION 28 C. R. 4 ISSUE NO. 1 MAY 20, 1909.</p>	<p>INFORMATION REGARDING ELECTRIC FIXTURES FOR PASSENGER EQUIPMENT.</p>	
<p>Note: The catalogue Nos. given are Safety Car Heating & Lighting Co's (S) and Castles & Sons. (C)</p>		
<p>Class of car on which used.</p>	<p>Where used</p>	<p>Catalogue No.</p>
<p>Observation and Sleeping car with smoking room.</p>	<p>2 - Light centre lamps. 2 - Light deck rail fixtures. 1 - Light deck rail fixture. 2 - Light bracket. 1 - Light bracket. 1 - Light corridor fixture. 1 - Light berth lamp. 3 - Light platform fixture.</p>	<p>S. 2276. S. 2277. S. 2278. S. 2279. S. 2280. S. 2281. S. 2282. S. 2283.</p>
<p>Observation and Sleeping car without smoking room.</p>	<p>2 - Light centre lamps. 1 - Light deck rail fixture. 1 - Light bracket. 1 - Light corridor fixture. 1 - Light berth lamp. 3 - Light platform fixture.</p>	<p>C. 1. C. 2. C. 3. S. 2281. S. 2282. S. 2283.</p>
<p>LIST OF PARTS LIABLE TO NEED RENEWING.</p>		
<p>Name of part.</p>	<p>Opal bowl for S. fixture No. 2283. Opal glass for S. berth lamp No. 2282. Switch Diamond H flush midget type. Socket Stone 1-9" keyless type No. 2. Incandescent lamp 8 C. P. Stone Oream lamps. Incandescent lamp 16 C. P. Stone Oream lamps. Electric fan Type 12" blade, 24 volt direct.</p>	<p>plate 2" x 1" 34 volts. 24 volts current, Diehl Mfg. Co. Drawing 0813b</p>

5 C R 5

<p>CANADIAN PACIFIC RAILWAY OFFICE OF THE MASTER CAR BUILDER. CAR REGULATION 5 C R. 5 ISSUE NO. 1 APRIL 10, 1908.</p>	<p>MOUNTING OF CAST IRON WHEELS</p>
<ol style="list-style-type: none"> 1. WHEELS WITH REINFORCED FLANGES -- i. e. wheels having 8 B-8" total width of tread and flange-- must be mated on the same axle. 2. WHEELS WITH CORRESPONDING TAPES must be mounted on the same axle. 3. USE M. C. B. STANDARD WHEEL CIRCUMFERENCE MEASURE shown on M. C. B. sheet No. 7 when taping wheels. 4. NEW WHEELS MUST BE INSPECTED for flange thickness, by maximum and minimum gauges as shown on M. C. B. Sheet No. 12. 5. NEW WHEELS must be retaped before mounting. 6. WHEN ENTERING AXLES IN WHEEL BORE care must be taken not to damage the journal. After entering the first wheel on axle, journal must be protected by using wooden wedge or brass lining between the wheel bore and the journal. 7. BEFORE REMOUNTING SECOND HAND WHEELS they must be inspected for shape, thickness and height of flange-- M. C. B. Limit Gauges & method of using same are shown on drawing No 4831 1-6. 8. SECOND HAND WHEELS MUST BE TAPED before remounting, and wheels with corresponding tapes must be mounted on the same axle. 9. WHEEL PRESS SHOULD BE FITTED so that either wheel can be pressed on without having to turn wheels and axles. 10. WHEN MOUNTING CAST IRON WHEELS press on both wheels together, using centre Gauge-- as shown on Drawing No. 4471 1-3-- on the wheel farthest advanced-- when end of gauge reaches centre mark on axle stop pressing this wheel, and do all further pressing on the other wheel, using Standard Reference Gauge -- as used for mounting-- and as shown on M. C. B. Sheet No. 12, afterwards checking wheels -- at eight equidistant points on the circumference-- by the other side of gauge -- "as used for inspecting" -- If wheels are out of true, this indicates either a warped wheel or defective boring. 11. WHEEL BORE AND WHEEL SEAT on axle must be lubricated with oil before wheels are mounted. Axle keep journal from rusting. Paint oil must not be used. 	
<p>LENGTH OF CENTRE GAUGES SHOULD BE AS FOLLOWS: For wheels 8 B-8" wide over tread and flange. S. 2 9-16" For wheels 8 1-2" wide over tread and flange. S. 2 11-16"</p>	
<p>Painted with a mixture of white lead and Freight journal must be given a coat of same mixture to</p>	
<p>OVER</p>	

To file the cards a box which is illustrated on pg. 7 is furnished, and it is expected that in a short time it will amount to a text book, covering the maintenance of our equipment, at all times revised to date. It has been found that to a large extent it is advisable to eliminate parts of the contents of instruction books and issue on cards, as it is easily seen that any part of the subject can be revised and reissued much more easily and cheaply than by reprinting an entire book. The result is that they are revised, where a book would not be. The difficulty of filing circular letters was explained earlier in this paper. In contrast with this there is only one manner of filing these cards, which is instantly apparent to any man of ordinary intelligence. The subjects are numbered in numerical order. The first in the file is the index card; the second is the card issued quarterly showing the active cards. I have sometimes visited points where the

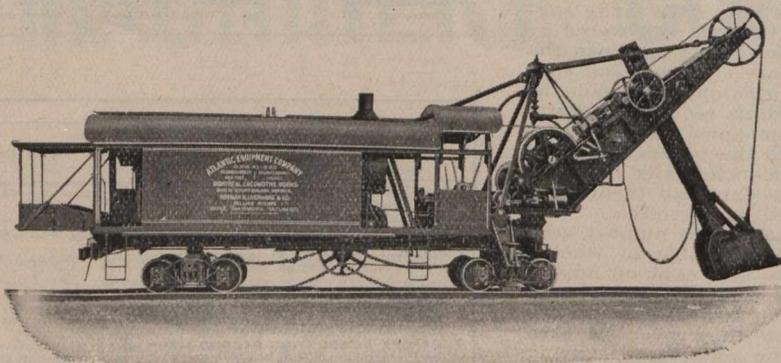
LOCOMOTIVES FOR ALL CLASSES OF SERVICE



Consolidation Type Freight Locomotive, Built for Eastern British Columbia Railway.

Total weight of engine in working order, 186,310 pounds. Weight on driving wheels, 166,100 pounds. Diameter of driving wheels, 51 inches. Boiler pressure, 210 pounds. Cylinders, 20 x 28 inches. Maximum tractive power, 39,200 pounds.

ATLANTIC STEAM SHOVEL



Direct wire rope hoist with but one sheave, instead of chain hoist with from five to seven sheaves, reduces delays and loss of time due to breakdowns, increases the efficiency of the engines, and reduces repair bills as well as fuel consumption.

Finished, interchangeable spare parts always on hand at works.

MONTREAL LOCOMOTIVE WORKS, LIMITED
BANK OF OTTAWA BUILDING, MONTREAL, CANADA

cards were not properly filed through carelessness, and have properly filed and checked them, to see if the file was complete, within five minutes' time, which could not be accomplished with any circular letter system I have seen, regardless of time. Such assistant foremen, leading hands, and inspectors, as do not have a place in time to keep a file of cards, not only have access to the regular office file, but it is insisted that they read the cards and familiarize themselves with up-to-date instructions.

It is, of course, necessary to occasionally revise the cards to take care of new developments, such as a change in shop practice or the alteration of drawings that would affect the subject covered. When this is done the card retains its index number, but is given a new issue number corresponding with the number of times it has been issued, and is also given the last date of issue. When a revised card is issued, the card which it supersedes is returned to the office. It has not been found necessary to revise many cards. The cards that have been revised were those issued before the present more thorough system of preparing them was developed and the revisions have consisted principally in more thoroughly covering the subject. It has not been found necessary to make any extensive arrangement for revising, as, the correspondence having the same index number, it is an easy matter to run through a file and make note of developments subsequent to the last date of issue. This, however, we find can be more easily done by keeping one set of cards especially for revision purposes, and making notations on the cards in this file of anything affecting the subject they cover.

It is the intention to institute a system of examination of foremen and inspectors with regard to their familiarity with the cards covering their work. This is carried on to some extent at present, although it is not perfected, but, with a properly arranged set of standard instructions and regulations, it is evidently a comparatively easy matter to establish a periodical examination of foremen and others, which will insure their familiarity and thorough understanding of the methods which they are expected to pursue in handling their work.

It should be understood that the development of this system has not been followed, regardless of expense, to the extent of obtaining an unnecessary degree of refinement, but on the contrary, in addition to the benefits derived by those to whom instructions are issued, through the saving of time, and their having a clear understanding of what is required, the amount of office work has been greatly reduced, with the result that more attention can be given to other things. When a card is once issued it furnishes a foundation upon which any changes or alterations can be made with comparatively little work, and avoids the reconsideration of any subject as a whole. To a large extent, where explanatory correspondence was formerly used, where work has been neglected or information asked, it is only necessary to call attention to the card and insist on instructions being carried out.

Our set of cards is by no means complete, as we have not covered all the subjects we originally intended to cover, but we daily find an extended scope for their use beyond that originally anticipated. While the work of drafting and revising will never be complete, we expect that in a short time the main subjects will be so thoroughly covered that the work of preparing will be comparatively small.

One thing that has been learned in the development of this system is that, before the preparation of a card is commenced, it is best to sub-divide a subject, covering sub-divisions by separate cards. As an instance of this, the card covering gas equipment, 28-C. R. 1, gives full catalogue reference as to lamps, class of cars in which used, and where used in car, also catalogue reference of parts liable to failure. 28-C. R. 2 gives instructions regarding cleaning and testing of gas equipment both at terminals and shop. 28-C. R. 3 gives instructions regarding gas mantles, showing catalogue reference, stating where large and small mantles are used, how and in which car extra mantles will be carried, and method of applying new mantles. For electric train lighting equipment we have the cards sub-divided into instructions for shops, originating terminals, and intermediate terminals, as we wish the men at intermediate terminals to have a clear understanding as to the extent to which they should attempt to make repairs to a car in transit, with brief instructions as to how to locate cause of trouble and make repairs quickly.

I will cite a few of the advantages we have found in using cards in place of circular letters. In

12. When Cast Iron Wheels are pressed on axles, THE STATION SYMBOL, WITH MONTH AND YEAR MUST BE STAMPED ON ONE END OF AXLE, AND OLD RECORDS DEFACED.

13. At stations where Cast Iron Wheels are mounted on axles A COMPLETE RECORD MUST BE KEPT ON M. C. B. FORM NO. 102

14. STANDARD PRESSURES FOR MOUNTING WHEELS ON AXLES are shown on Car Regulation Card 8 C R



5 C R 6

CANADIAN PACIFIC RAILWAY.
OFFICE OF THE MASTER CAR BUILDER
CAR REGULATION 8 C. R. 6
ISSUE NO. 1 APRIL 10, 1908.

MOUNTING OF STEEL TYRED WHEELS.

1. WHEELS HAVING TYRES WITH REINFORCED FLANGES -- i. e. tyres having 6 5/8" total width of tread and flange-- must be mated on the same axles.
2. WHEELS OF THE SAME DIAMETER ON TREAD must be mounted together
3. WHEN ENTERING AXLES IN WHEEL BORE, care must be taken not to damage the journal-- after entering the first wheel on axle, journal can be protected by using wooden wedge or brass lining between the wheel bore and the journal.
4. WHEEL PRESS SHOULD BE FITTED so that either wheel can be pressed on without having to turn wheels and axles.
5. WHEN MOUNTING STEEL TYRED WHEELS COMPLETE press on both wheels together, using centre Gauge -- as shown on Drawing No. 4471 1-4-- on the wheel farthest advanced-- when end of gauge reaches centre mark on axle, stop pressing this wheel and do all further pressing on the other wheel, using Standard Reference Gauge -- "as used for mounting"-- and as shown on M. C. B. Sheet No. 12, afterwards checking wheels -- at 3 equidistant points on the circumference-- by the other side of the gauge -- "as used for inspecting"-- Use check gauge for discs of steel tyred wheels -- as shown on Drawing 4471 1-4-- measuring from the two farthest sides of the inside retaining rings of the two wheels. If this does not check up, then examine tyre to see if it has been correctly turned. See Car Regulation 8 C. R. 10.

LENGTHS OF CENTRE GAUGES SHOULD BE AS FOLLOWS:-

For wheels 5 5/8" wide over tread and flange.	2' 2 5/16"
For wheels 5 1/2" wide over tread and flange.	2' 2 11/16"

LENGTHS OF CHECK GAUGES SHOULD BE AS FOLLOWS:-

For 36 1/4" wheels	"	4' 7 1/4"
For 34" and 40" wheels	"	4' 7 1/2"

6. WHEN MOUNTING CENTRES OR DISCS NOT FITTED WITH TYRES press both on together using Centre Gauge -- as shown on Drawing No. 4471 1-4-- on the disc farthest advanced -- When end of gauge reaches centre mark on axle, stop pressing this disc and do all further pressing on the other one, using Check Gauge for Discs of Steel Tyred Wheels -- as shown on Drawing No. 4471 1-4-- at 3 equidistant points in the circumference.

LENGTHS OF CENTRE GAUGE SHOULD BE AS FOLLOWS:-	ES SHOULD BE AS FOLLOWS:-
For discs for 36 1/4" wheels	- 2' 8 5/8"
For discs for 34 and 40" wheels	- 2' 8 3/4"

LENGTHS OF CHECK GAUGES SHOULD BE AS FOLLOWS:-

For discs for 36 1/4" wheels	- 4' 7 1/4"
For discs for 34 and 40" wheels	- 4' 7 1/2"

OVER.



7. WHEEL BORE AND WHEEL SEAT on axle must be painted with a mixture of white lead and Freight Lubricating Oil before wheels are mounted. Journals must be given a coat of same mixture to keep journal from rusting -
Paint oil must not be used.
8. At stations where Steel Tyred Wheels are mounted on axles A COMPLETE RECORD MUST BE KEPT ON M. C. B. FORM NO. 102
9. When Steel Tyred Wheels are pressed on axles, THE STATION SYMBOL, WITH MONTH AND YEAR MUST BE STAMPED ON ONE END OF AXLE, AND OLD RECORDS DEFACED.
10. STANDARD PRESSURES FOR MOUNTING Steel Tyred Wheels and Discs are shown on Car Regulation 8 C R. 1



the first place, they are prepared with more care and cover in detail all points of the subject referred to, while circular letters are more apt to be hastily prepared, and subsequent circular and other letters often give further instructions and modify or cancel portions of former ideas. This is often confusing to the persons receiving such letters, causes extra work checking with previous letters, and also necessitates great care to avoid issuing contradictory instructions. With the card system all obsolete instructions are cancelled, but, when letters are depended upon, any prudent foreman can refer to some long-forgotten letter as authority for almost any practice that may be found at his station.

Another advantage is that, when a card is to be prepared, it is found that there are many points in connection with the subject that have not received the necessary amount of attention. Frequently



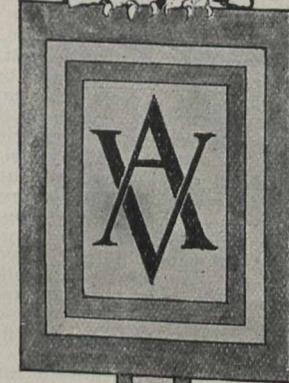
VANADIUM IS AS OLD AS THE WORLD

THE only thing new about Vanadium is man's knowledge of it:—where to find it,—how to get it into a useful state,—how to apply it,—and what it will do.

Its History:—

1. A Chemical element hidden in earth and rock since Time began.
2. Discovered by Sefström in 1830.
3. Isolated as a metal by Sir Henry Roscoe in 1867.
4. Classed as a rare element, and used for making dyes and tinting glass.
5. In 1890 there wasn't enough ore in sight to make a lump of Vanadium big as a baseball. Valued then at \$10,000.00 a pound.
6. Minute quantities found in the finest Swedish Irons and Steels.
7. Immense ore beds found in Peru and purchased by The American Vanadium Co.
8. Methods of refining developed and accurate data secured by Experts concerning the effects of Vanadium on Iron, Steel, Copper, Bronze and other metals.
9. The American Vanadium Company's factories built at Bridgeville, Penna., and Vanadium Alloys produced in commercial quantities, absolutely true to specified analysis, and low enough in cost to permit their use in all High Grade Steels, such as armor plate, springs, forgings, gears, shafts and piston rods; also in iron and steel castings.
10. Vanadium recognized by Steel Experts all over the world as "The Master Alloy." Vanadium is old,—the knowledge is new. We are prepared to furnish all you want of either. Booklets free. Mention your line of work, and particular needs.

The American Vanadium Company
324 FRICK BUILDING
PITTSBURGH, PA.



parts have not been maintained as they should be and could have been without extra expense, and inexpensive alterations can be made and betterments applied. For example, in considering the maintenance of doors and door fixtures, we find that a 3-inch stop secured in a certain manner is necessary in place of a 2-inch stop, that the brackets should be rivetted on (a plain inexpensive bracket can be used for all wooden cars), that the hasp should be secured with a wrought staple instead of malleable and malleable wedge applied to doors of old cars in place of wooden. All these changes were found advisable on going into the subject thoroughly, in order to avoid as far as possible any afterthoughts that would make it necessary to change instructions, and that when repairs or alterations were made they would all be considered at once and be cheaply done. It might be said that this could have been done independently of the regulation card, which is of course true, but the fact remains that, had the work been ordered in the usual way by circular letters, it is probable that first one item and then another would have been changed, and, in place of one clear, concise set of instructions on a single card, a series of letters would have been issued, which would have been far more difficult to follow up.

Another advantage that has been found is that some devices, having a number of parts with in many cases no established name for each part, have to some extent been ordered complete to get one part, the heavier and more expensive pieces being held indefinitely in stock, where they have little better than scrap value, owing to their freedom from failure. To overcome this we have issued cards on the various devices or specialties, with full information as to what parts have proven liable to failure, instructions as to what should be ordered, pattern numbers, stating which parts are interchangeable, and other necessary information, and coining a name where necessary. On the back of the card is printed a photograph of the device, showing number and name of each piece, which has promptly enabled the foreman to obtain the parts which he had difficulty in procuring before, and prevented the purchase of parts not required.

Another point of advantage in the card system, which also illustrates the disadvantages of depending on circular letters and blue prints, is found when an officer visits a station with limited time to check various subjects. He is often confronted by some subject on some points of which, on account of possible confusion, neither he nor the local man are entirely clear. They go to the office, and his time is consumed in looking over circular letters and correspondence pertaining to the subject, and drawing and pattern numbers, possibly having to follow the file through several years to determine what should be done on one subject, only to learn perhaps that a part of the instructions are missing, and at best having no assurance that the file is complete. His time should be used in looking at the actual work, assuring himself that proper shop practice is being followed, and that maintenance of equipment is promptly and economically conducted. Where maintenance cards are depended upon, the foreman would most likely be informed on the subject, and, if in doubt, a very few moments would locate the card and settle the matter.

In preparing these cards the difficulties often experienced by one of the staff more familiar with the subject—in sorting out various instructions, eliminating obsolete and cancelled instructions, filling in proper pattern, drawing, and form numbers, and dimensions and conditions under which certain instructions should be followed—have brought to us a realization of what we have been expecting of our foremen in the way of memory and office work, which expectations have not always been realized, or have been partially realized at the expense of proper supervision.

By the use of this system, it has been possible to have work done in a uniform manner, at points separated by thousands of miles, which could not always be done when other means of issuing instructions were used, and that when you step into the office of a foreman or inspector at the most remote station, even if he is not present, you can instantly locate his set of maintenance regulation cards, complete and properly filed, and, on questioning, he is almost invariably found to be familiar with all instructions pertaining to his work, having exactly the same understanding as his co-worker 3,000 miles distant.

The foregoing paper was read before the Canadian Railway Club recently.

53 M. R. 8.

Issue to a. b. d. e.

CANADIAN PACIFIC RAILWAY. ALL LINES MOTIVE POWER DEPARTMENT	MAINTENANCE REGULATION 53 M. R. 8. SHIPPING DEAD ENGINES ISSUE NO. 2, SEPTEMBER 15, 1909
--	--

1. When dead engines are being moved in trains it is advisable that they be placed in the front portion. In case two or more are together they must be separated, but not more than three cars apart. All brakes must be cut in and operative and the following precautions taken to prevent skidding of drivers due to boilers being empty, application of new brake shoes or tyres new or newly turned.
 - a. Out too cook under the engine's brake valve must be closed and wired in this position.
 - b. Driver brake piston travel must be lengthened a sufficient distance so that when brakes are applied fully by a 20 lb. reduction, not more than 35 lbs. will be shown on the gauge registering driver brake cylinder pressure.
2. Main rods are to be taken off, put together complete with straps and brasses and placed on the tender, side rods must not be removed unless necessary, and a speed of 20 miles must not be exceeded at any point. If the side rods are removed the maximum speed will be reduced to 10 miles per hour.
3. When an engine thus shipped is equipped with an engine truck brake the piston travel must be increased to at least two-thirds of the TOTAL TRAVEL.
4. On tenders handled empty without coal and water the tender piston travel must not be less than 9 inches. When fitted with slack adjusters they must be released sufficiently to insure 9" piston travel and their automatic operation prevented by removing the pipe connected with the brake cylinder and plugging the hole.
5. A competent man must be sent in charge of the dead engine or engines handled in any train.
6. The boilers and tenders should be emptied before the dead engines are put in the train and all superheater pipes, cylinders and W. A. B. pumps thoroughly drained.
7. Wrecked engine rods to be taken care of as stated in Clause 2. If the engine truck is destroyed or broken on 8 wheel, Mogul or Tan Wheel Engines they should not be hauled past the first siding until a temporary truck is put under and the weight of the engine distributed as well as circumstances will permit, the speed under these conditions must be limited to 10 miles per hour.
8. If the tyre is off any wheel on an engine or tender that wheel must be blocked up clear of the rail, under no circumstance must the wheel center be allowed to run on the rail.
9. Locomotives being shipped dead to Angus Shops must have such loose or easily removable parts as engine tools, signal lamps, oil cans etc. placed in the smoke-box, and smoke-box door fastened in usual manner.
- Car replacers to be placed in the tool boxes under tender frames and sealed up, on tenders not so equipped they are to be placed in tool box on the front of the tender.

13 M R 1.

Issue to a. b. c.

CANADIAN PACIFIC RAILWAY. ALL LINES MOTIVE POWER DEPARTMENT	MAINTENANCE REGULATION 13 M R 1 BOILER INSPECTION AND TESTING. NO. 3, AUGUST 14, 1909
--	---

1. Boilers must be tested by hydraulic pressure when engine is in shop for No. 1 or 2 machinery repairs, after any repairs have been effected to the boiler and in the case of boilers over 10 years old, at intervals of service not exceeding 12 months.
2. The temperature of the water used in filling and testing must not be less than 100 degrees; the test pressure must equal 25 per cent in excess of the authorised working pressure and must be indicated by a standard test gauge.
3. Jacket must be sufficiently removed to allow any leaks or weaknesses to be detected, especially those which may occur around the bottom of the barrel.
4. The test is to be reported on Form M P 18, and date of test filed in on Form 181 in cab of engine.
5. Boilers under 10 years old must be inspected internally the first time flues are removed after 2 years from the date of last inspection, and when over 10 years old within 2 years service from date of last inspection.
6. Inside of boiler to be thoroughly cleaned, edges of all joints scraped, careful examination made for grooving and pitting, longitudinal braces, dome and belly stays thoroughly examined and hammer tested, and thorough examination made for any weakness or defect.
7. All defects discovered must be marked by the Inspector for repairs and reported on Form M. P. 18. Fireboxes must be inspected when engine is in shop for No. 1 or 2 machinery repairs.
8. Inspectors will be held responsible for reporting all defects and calling attention to those caused by improper maintenance or construction.
9. Locomotive Foremen will be held responsible for tests being carried out and properly entered and reported.
10. See 18 M. R. 2 for additional inspection required for special classes.

76 M R 1.

Issue to a. b. f. g.

CANADIAN PACIFIC RAILWAY. ALL LINES MOTIVE POWER DEPARTMENT				MAINTENANCE REGULATION 76 M R 1 TIRE LIMITS OF WEAR AND DEFECTS ISSUE NO. 5, AUGUST 12, 1909		
Tire	Type of Locomotive	Service	Weight on pair of wheels	Thickness at final turning	MAXIMUM DEPTH OF GROOVE	
					After final turning	After other turnings
Driving	All Types	Pass	30000 lb. or over	2 inches	3-16 inch	1-4 inch
Driving	All Types	Pass	Under 30000 lb.	1-3-4 inch	3-16 inch	1-4 inch
Driving	Mogul	Freight	All weights	1-5-8 inch	1-4 inch	1-4 inch
Driving	Consolidation	Freight	All weights	1-3-4 inch	1-4 inch	1-4 inch
Driving	10 Wheel	Freight	All weights	1-5-8 inch	1-4 inch	5-16 inch
Driving	8 Wheel	Freight	All weights	1-1-2 inch	1-4 inch	6-16 inch
Driving	Switch	Switch	30000 lb. or over	1-1-2 inch	1-4 inch	3-8 inch
Driving	Switch	Switch	Under 30000 lb.	1-3-8 inch	1-4 inch	3-8 inch
Eng. Truck	All Types	All	All weights	1-3-8 inch	1-8 inch	3-16 inch
Ten. Truck	All Types	All	All weights	1-3-8 inch	1-8 inch	3-16 inch.

1. Engine and tender truck wheels must be taken out of service when tires are less than 1-4 inch thick.
2. Driving tires will not be allowed to run which have the following defects:
 - a. Flat spots due to sliding, 2-1-2" or over in length.

Elements of Transportation.—This is the title of one of a series of books on business subjects published by D. Appleton & Co., New York. It is written by E. R. Johnson, Ph. D., Professor of Transportation and Commerce, University of Pennsylvania, and author of a number of other works on transportation and transportation economics. The present book has been written with special reference to its use with classes in commercial and business high schools, and for classes in practical economics in normal schools and colleges. The subject is dealt with in four parts, viz.: steam railway transportation; electric railway transportation; ocean transportation; lake, river and canal transportation. The field is thoroughly covered in each part, and the various subjects are dealt with in a clear and simple manner, making it a valuable work for the general body of transportation employes, as well as for the student of economics. The volume is well illustrated, the specially engraved maps being an interesting feature. The price of the volume is \$1.50, and it may be procured through the Railway and Marine World's Book Department.

MONTREAL STEEL WORKS, LIMITED

P. O. BOX 2369 MONTREAL

MANUFACTURERS OF

STEEL CASTINGS SWITCHES AND TRACK WORK

(Acid Open Hearth System)

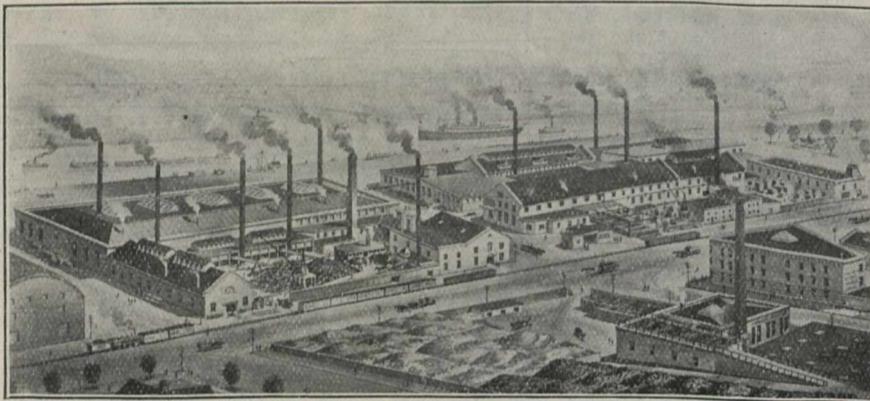
for Steam and Electric Roads

MANGANESE STEEL CASTINGS

INTERLOCKING
PLANTS

for wearing Parts, insuring Great Hardness and Durability

TOWER, CLIMAX and SHARON COUPLERS and PARTS THEREOF
for PASSENGER and FREIGHT CARS and LOCOMOTIVES



SPRINGS
OF ALL
KINDS

TRUCKS
FOR
ELECTRIC
CARS

AGENTS FOR CANADA FOR

THOS. FIRTH & SONS, LIMITED
Sheffield, England

"Speedicut" High Speed Steel, Tool Steel, Axe Steel,
Saw Steel, Files, etc.

A large stock carried in our warehouse.

BARROW HÆMATITE STEEL CO.
Barrow-in-Furness, England

Quotations for Tee Rails, Fish Plates, etc., promptly
furnished.

Catalogues sent on application.

TORONTO OFFICE: 703 TEMPLE BUILDING

P. O. BOX 82

Machine Shop System and Economy.

By H. J. Varlow, General Foreman C.P.R.,
Fort William, Ont.

Machine shop economy may be summed up as developing every machine to its utmost efficiency, and obtaining the maximum output from each. Consistent with the requirements and nature of the work, which can only be accomplished by a good system of tool work, a portion of the shop should be devoted to the manufacture and storing of tools, for the whole of the shop's requirements, discriminating between poverty and excess, and discontinuing all waste. An attendant should be appointed to supply the wants of the men, who come provided with necessary checks, which all employes are supplied with when given employment, the checks being numbered as on the register. When a tool is required a check is handed in to the attendant, he at once supplies the tool, and on the returning of the tool the check is handed back to the workman. Should the tool have sustained any damage, the fact is recorded by book being kept for the purpose, with spaces for the workman's name, with number, date and remarks as to conditions. Tools should be kept in first-class condition for good results. Taps, stocks, dies, gauges, twist drills, templates, milling cutters, ratchets, manarils, etc., are all dealt with in this manner.

A shop without system and organization is simply chaos, whereas with them everything is reduced to order; every man knows what to do, and when and where to do it. System does not require any more workmen, but it reduces the work of existing hands, and everything is done well because each is individually responsible for the particular work in his care. At the same time the responsibility is reduced to a minimum for every individual knows the system, and that it will be rigidly carried out. In fact, it is impossible to grapple with large concerns without it and even small ones become utter failures. It also insures that nothing is interrupted, not only in one shop, but every portion of the works, if by absence for whatever reason of foreman, man or apprentice. Every machine is fixed to a plan, so that heavy or light work can be done most expeditiously. Suitable crane power or lifting hoist are found exactly where wanted.

The beneficial effect of accuracy in tool work is well and easily illustrated by the twist drill, the circumferential speed for half-inch to seven-eighths inch diameter is 20 to 30 ft. per minute on mild steel, and a good feed is about 1-100 inch for each revolution, that is half that amount per lip for each revolution. Consequently, if the drill is ground with uneven lips, the whole cut comes on one edge. Therefore, the drill is soon damaged, and the driller reduces the feed until the one edge cuts well, which is apparently to one-half the feed. To drill at the smallest cost, absolute accuracy is required throughout, each edge must be of equal length for obvious reasons, and have the same angle with the centre of the drill.

It will be clearly understood that grinding is an important factor. Two very important points respecting all tools are the cutting and clearance angles in all ordinary lathe work. Deep cuts and course feeds are first principles, one doughing and one finishing, bringing down the speed to suit the cut rather than suit the cut to the speed, for the greatest amount of work will be done in a given time, that is let it be a maximum of feed rather than speed, and have the finishing a good sliding cut.

Milling machines now take the most important place of all tools in any shop, efficiency and economy. It is almost im-

possible to push the utility of the universal machine too far. One of the first essentials is to well man the machine, and keep the cutters in first-class order, as success depends entirely upon the facility for production and re-grinding cutters, it being an absurdity to use a cutter beyond a profitable period of service, consequently there is less wear and tear upon the machine. It is needless to make comparison between milling and other machine tools, it is also difficult to estimate and compare the cost of work done by milling with that of other machines, because sometimes the milling machine embodies the work of various others. Where it replaces slotting or planing only its superiority is at once recognized. It is an important machine and cannot be set up too rigidly on good foundations. Let any part of the machine be defective and it will effect the work done.

January Birthdays.

Many happy returns of the day to:—

W. U. Appleton, Assistant to Superintendent of Motive Power Intercolonial Ry., Moncton, N.B., born there Jan. 29, 1878.

G. Bazzard, ex-Freight and Passenger Agent Delaware, Lackawanna and Western Rd., Toronto, now of Hamilton, Ont., born at Westhide Court, Herefordshire, Eng., Jan. 3, 1838.

A. H. Bears, Master of Bridges and Buildings C.P.R., Saskatoon, Sask., born at Charlottetown, P.E.I., Jan. 6, 1857.

F. X. Belanger, General Freight and Passenger Agent Temiscouata Ry., Riviere du Loup, Que., born at Chlorydormes, Que., Jan. 20, 1876.

R. H. Bell, Commercial Agent Canadian Northern Ry., Pittsburg, Pa., born at Toronto, Jan. 13, 1865.

J. R. Bowles, City Freight Agent, G.T.R., Montreal, born at Sarnia, Ont., Jan. 14, 1874.

G. McL. Brown, General Traffic Agent C.P.R., London, Eng., born at Hamilton, Ont., Jan. 29, 1866.

W. H. Burr, Traffic Manager Dominion and Western Express Companies, Toronto, born at Bloomington, Ill., Jan. 19, 1864.

C. A. Cotterell, Chief Train Dispatcher district 1, Pacific Division, C.P.R., Revelstoke, B.C., born at Ender, Eng., Jan. 18, 1877.

W. A. Cowan, Resident Engineer C.P.R., London, Ont., born at Galt, Ont., Jan. 22, 1877.

J. E. Dalrymple, Assistant Freight Traffic Manager G.T. Pacific Ry., Winnipeg, born at Montreal, Jan. 1, 1869.

Sir Sandford Fleming, K.C.M.G., Director C.P.R., born at Kirkcaldy, Scotland, Jan. 7, 1827.

Gordon Grant, Chief Engineer National Transcontinental Railway Commission, Ottawa, born at Dufftown, Banffshire, Scotland, Jan. 2, 1865.

H. V. Harris, ex-General Manager Midland Ry. of Nova Scotia, Truro, N.S., now of Louisville, Ky., born at Devonport, Devonshire, Eng., Jan. 16, 1857.

F. L. Hay, Superintendent Sleeping and Dining Cars and News Service C.P.R., Vancouver, B.C., born at Portland, Ore., Jan. 16, 1868.

G. F. Hichborn, formerly Agent Great Eastern Fast Freight Line, New York City, born at Boston, Mass., Jan. 31, 1875.

Carl Howe, Manager New York Central Fast Freight Lines, Buffalo, N.Y., born at Berrien Springs, Mich., Jan. 11, 1870.

W. C. Hunter, ex-Manager New Brunswick Coal and Ry. Co., Sussex, N.B., born at St. John, N.B., Jan. 4, 1865.

W. J. Hunter, Division Freight Agent G.T. Pacific Ry., and Commercial Agent G.T.R., Winnipeg, born in Toronto, Jan. 10, 1864.

H. G. Kelley, Chief Engineer G.T.R.,

Montreal, born at Philadelphia, Pa., Jan. 12, 1858.

Jas. Kent, Manager C.P.R. Telegraphs, Montreal, born Jan. 15, 1854.

A. Lichtenhein, Galena Signal Oil Co., New York, born there Jan. 15, 1855.

A. J. McGee, Secretary-Treasurer Temiskaming and Northern Ontario Ry. Commission, Toronto, born at Lachine, Que., Jan. 24, 1876.

G. Pepall, Canadian Agent National Despatch—Great Eastern Line, Toronto, born at High Wycombe, Buckinghamshire, Eng., Jan. 15, 1849.

W. Phillips, General Eastern Agent Canadian Northern Ry., and General Freight and Passenger Agent, Canadian Northern Ontario Ry., Toronto, born at Toronto, Jan. 31, 1870.

W. Pratt, Superintendent Sleeping and Dining Cars C.N.R., Winnipeg, born at Sibbertoft, Northamptonshire, Eng., Jan. 18, 1870.

J. Pullen, Assistant Freight Traffic Manager G.T.R., Montreal, born at Shepton Mallet, Somersetshire, Eng., Jan. 23, 1863.

L. J. Rouleau, Travelling Freight Agent and Agent National Despatch—Great Eastern Line, Montreal, born there Jan. 6, 1879.

S. L. Shannon, Comptroller and Treasurer Intercolonial Ry., Moncton, N.B., born at Halifax, N.S., Jan. 18, 1862.

S. J. Sharp, Western Passenger Agent C.P.R., Atlantic Steamship Line, Toronto, born at London, Ont., Jan. 21, 1860.

J. R. Steele, Freight Claims Auditor C.P.R., Montreal, born at St. John's, Newfoundland, Jan. 14, 1856.

J. G. Sullivan, Assistant Chief Engineer C.P.R., Montreal, born at Bushnell's Basin, N.Y., Jan. 11, 1863.

S. G. Wagstaff, Commercial Agent G.T.R., Toledo, Ohio, born at Hamilton, Ont., Jan. 6, 1866.

F. J. Watson, Division Freight Agent G.T.R., Montreal, born at Toronto, Jan. 12, 1866.

G. H. Webster, C.E., Vancouver, B.C., born at Creemore, Ont., Jan. 31, 1866.

T. H. White, Chief Engineer in charge of C.N.R. surveys in British Columbia, Vancouver, B.C., born at St. Thomas, Ont., Jan. 27, 1848.

We are officially advised that the reports that the C.P.R. is figuring on operating its trains between Montreal Jct. and the Windsor St. Station, Montreal, by electricity, are entirely incorrect.

The Province of Quebec Association for the Protection of Fish and Game, held its annual dinner and meeting in Montreal, Dec. 9, 1909. An appeal was made for subscriptions and \$3,000 was raised in the room, of which W. E. Davis, Passenger Traffic Manager G.T.R., contributed \$500.

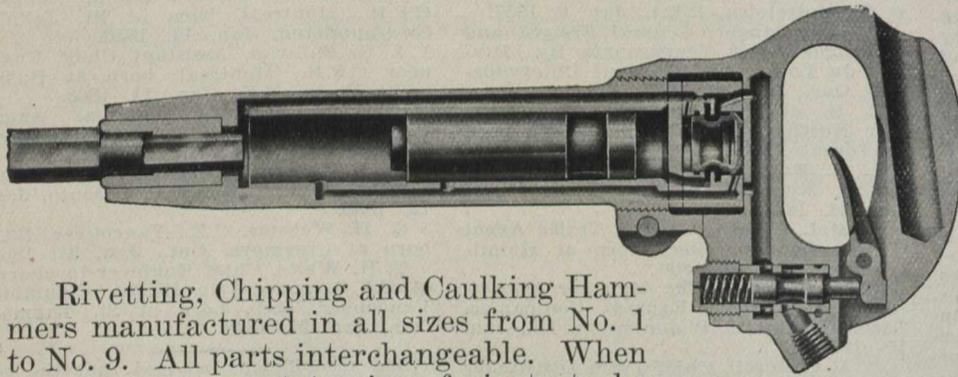
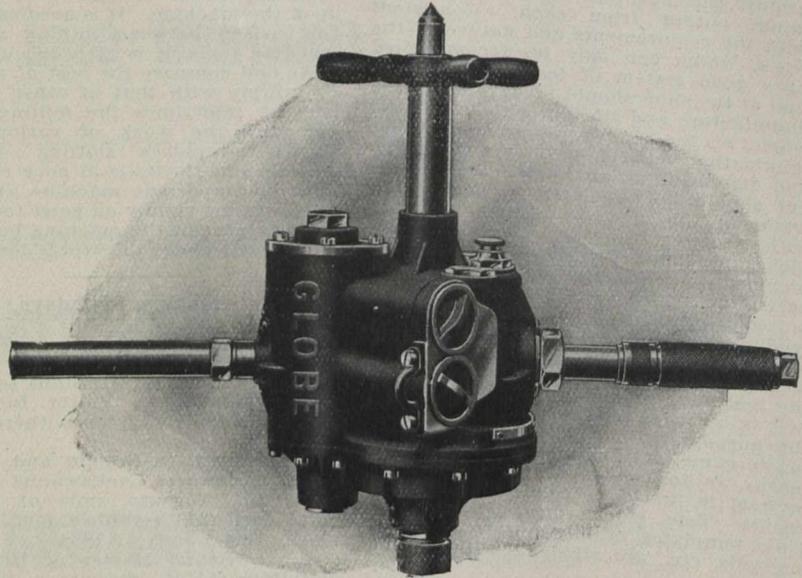
In giving evidence at the inquiry in Halifax, N.S., into the alleged coal operators' combination Dec. 16, General Manager Cowans of the Cumberland Ry. and Coal Co., stated that the company had practically lost all its trade owing to the strike at Springhill collieries. It would take a year to get the collieries in the position in which they were a year ago, when the strike was declared. The company owns a railway extending from Springhill mines to Parrsboro', N.S., 30 miles.

During Oct., 1909, 26 employes were killed and 44 injured in the course of their work on Canadian railways. Of the fatal accidents, nine were due to being run over, seven to collisions, four to falls, two to being caught between cars and one each to being struck by an object in passing, to blood poisoning, to a derailment, and to falling material, while of the other accidents, 15 were due to derailments, nine to collisions, seven to being run over, four each to explosions, to falls and to being caught between cars, and one to falling material.

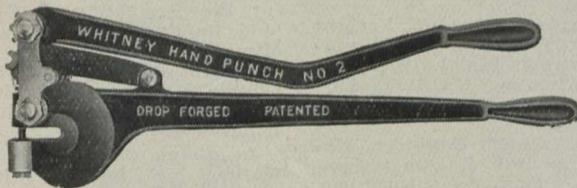
GLOBE PNEUMATIC ENGINEERING CO., LTD.

LONDON, ENGLAND

Globe Drills. These tools are patented and manufactured by J. W. Tierney exclusively for the Globe Pneumatic Engineering Co. The workmanship and material is of the very best. Sizes and capacities from 9-16 in. to 3½ in. Reversible or Non-Reversible Drills, reciprocating type. Air pressure required, 60 to 100 lbs. per sq. inch.

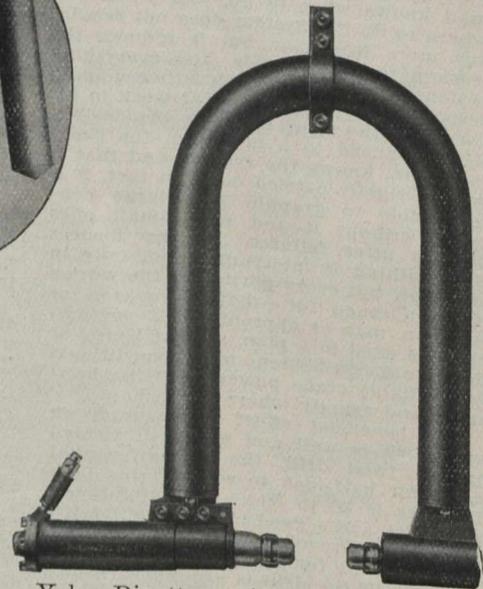


Rivetting, Chipping and Caulking Hammers manufactured in all sizes from No. 1 to No. 9. All parts interchangeable. When ordering, please state size of rivets to be driven.



WHITNEY HAND PUNCH. The most modern and labor-saving tool of its kind on the market for manufacturing plants and general repair of outside construction work, drop forged, total length 23 in.; length of lower level, 22 in.; weight, 11 lbs.; capacity, ¼ in. hole in ¼ in. plate or its equivalent, punches up to ½ in. in lighter material. Write for price. We also carry a complete line of Machine Tools generally; High Speed Steel, special twisted High Speed Drills, Ultra Rapid Water Hardening Steel and Steel for all purposes. Write for prices.

Composite Bearings Manufactured under Canadian Patent No. 115784



Yoke Riveters, Angle Iron Attachments, Holder-ons, Deck Rivetting Machines, Jam Riveters, Pneumatic Stone Cutting Plants and other appliances.

Greatest efficiency, accessibility, lightness coupled with rigidity and strength are a few of the leading features of these pneumatic tools. We solicit enquiries.

MUSSENS LIMITED

Head Office,

MONTREAL

Branches

Toronto, 73 Victoria St.

Cobalt, Hunter Block

Winnipeg, 259-261 Stanley St.

Vancouver, 614 Hastings St., W.

COPPER AND STEEL FOR LOCOMOTIVE FIRE BOXES.

By H. B. Lake, Chemist, C.P.R. Western Lines.

In commencing a consideration of the suitability of these two metals for the making of locomotive fire boxes, it may be advantageous to tabulate their principal physical properties.

Metal	Sp. Gr.	M. Pt.	PHYSICAL PROPERTIES.								
			E. Con. @ 0° C.	T. Con.	Ratio of Wt.			Ratio of Thermal Conductivity.			
Copper	8.9	1080° C.	52	73.6	9			6			
Iron (Steel)	7.9	1600° C.	9.7	11.9	8			1			
NOTE:—E. C. compared with Mercury @ 0° C.=1 T. C. compared with Silver=100.											
Metal	% pure	C.	Fe.	Si.	S.	P.	As.	Pb.	Sb.	Bi.	An. and Ag
Mechl.	99.46	—	.14	—	—	—	.10	—	—	.30	—
Copper Electrolytic	99.47	—	.0189	—	—	—	.0015	.0013	.0010	.0008	—
Mn.											
Steel (Firebox)	99.285	.15	.45	.035	.04	.04					
TENSILE STRENGTH AND DUCTILITY											
Metal	Breaking strength, lbs. per sq. inch	Elastic limit	Elong % on 8 ins.	Redtn. of area %	Cold bend	Hot bend	Drifting test				
Copper Electrolytic	60,480	49,280	20	20	Flat upon itself	Flat upon itself	Greater than for steel				
Steel (Firebox)	52,000 to 62,000	32,000	26	45%	Bend double	Bend double	3/8" hole to 2"				
NOTE:—Bending tests for steel are generally around diameter twice thickness of plate. Copper easily bends double flat.											

It appears therefrom that sheet copper weighs 1/8 more than sheet steel. Assuming the price of steel at 3c. and copper at 21c., then copper costs 7 times as much as steel, and as the thickness of the sheets of copper used in a firebox are generally about twice those for steel, the initial cost of the material for the copper box will be a maximum of 16 times that for a steel box. However, we have to allow for the value of the scrap copper which locally is stated to be 75%, and allowing 5% off this for the steel scrap, this reduces the ratio of the cost of the copper plate to about 5 times that of the steel.

Now we come to the labor cost of making the box. This ought to be in favor of copper, being the easier metal to work, less wear and tear on tools, and the time required to make the copper box ought to be less. Where cost of labor bears a high ratio to cost of material, then this factor will increase in importance.

The possible life of the two fireboxes depends largely on local conditions; but with copper boxes it appears to be, on English roads, about 10 years=800,000 miles, and copper tube plates last about five years in hard, constant service at high pressure. Steel boxes, under similar conditions, only appear to give a life of one year=80,000 miles before requiring repair, and on a certain section of the C.P.R. where the water supplies are of medium quality the side sheets of steel boxes in new engines have required renewal inside 12 months=about 45,000 miles. Hence the labor expended in making steel boxes is as much, or more, than in making copper boxes, and totally with labor for repairs it is apparently safe to assume that it is five times as great. Where labor costs as much, and more, than the material used in the box this will reduce the relative life cost of the two boxes to copper 1 is to steel 1. This reduces the considerations to the relative time engines fitted with either kind of box would spend in the shops directly consequent to the copper or steel firebox. Evidently if a steel box required more frequent repair the comparison will be in favor of copper.

Another important consideration is the greater reliability of one material by which engine failures, or delays, might be less than with the other. Copper is more resistant to corrosion than iron, and being higher in purity than mild steel, as tabulated 99.5: 99.28, and electrolytic copper (whilst equally ductile and tenacious with that produced by smelting and rolling) is even purer, being 99.9. Pure iron, and more readily steel, is dissolved by pure water, and when carbonic acid and air are present the action is accelerated. Also the impurities in the steel are segregated, and

are more readily acted upon with local electrolysis producing pitting. Copper is not acted upon by pure water at any temperature, and even resists the action of hydrochloric acid if air is absent, and is far more resistant to corrosion than steel.

As to tensile strength copper is almost equal to very mild steel, and in ductility very much higher. It is, therefore, less physically damaged by the punishing operations of riveting and bending than steel, and makes a tighter and more tenacious joint than steel with the tubes or flues. This superiority was demonstrated in a series of tests made by J. A. Holden, of the G.E. Ry., Eng. He expanded steel flues into copper and steel plates, and then pulled the plates. Out of 12 tests the tubes started in the steel plates 10 times, and finally 11 tubes pulled through the steel, whilst 11 remained tight in the copper plates. The tubes were expanded in taper and straight holes, the former giving more uniform results. The plates used were copper 1 1/4" thick, and 3/4" thick steel. No ferrules were used. Bending over did not improve the hold in steel plates, but increased the tenacity in copper plate from 7 to over 12 tons pull required to remove tube.

In reply to a letter I addressed to him, B. A. Raworth, Editor of Engineering, London, Eng., points out that, "The merit of the copper firebox is that it lasts a long time; the material is exceedingly tough and plastic, and stands the very severe strains caused by differences of temperature without exhibiting fatigue." In addition, the plates are very much thicker than in the steel box; the tube sheet is generally 1" or 1 1/8", while the side sheets are 5/8" thick. "The screwing of 3/4" or 7/8" stays into a 3/8" steel plate can never be made a secure job, while in the 5/8" plate, of course, the stays get a great deal better hold. The flanging of copper, of course, is a much easier matter than the flanging of steel, and the plates are not nearly so apt to crack in the corners (in the course of time) where the flanging has been done."

G. H. Churchward, Chief Mechanical Engineer of the G. W. Ry., of England, states that "In 1901 we fitted 14 sets of steel firebox plates in Belpaire boilers, working at 180 lbs. per sq. inch. Thickness of the tube plates was 5/8" and 3/8" below. The wrapper was in one plate 3/8" thick, and the back was 3/8". The life of the boxes varied between 30,000 and 80,000 miles. No signs of failure occurred in the crown of the firebox where the vertical stays were tapped into the plate, and had a nut and washer underneath. Copper stays were used and the boxes failed generally by cracking from the stay holes in the tube and

back plates, as well as in the wrapper plate. The failures were probably caused by the work done in riveting over the stay heads, producing initial stress in the plates round the holes."

In reply to the same question W. J. Benton, Consulting Engineer, of Leeds, England, writes, "The copper firebox is looked upon as an old and thoroughly reliable servant; its advantages are, when of good quality, uniformity of texture, freedom from lamination and blistering, resistance to corrosive action of various waters; resistance to the adhesion of most kinds of scale; ductility, which makes it easy to work, and to stand repeated racking strains; good conductor of heat, and it stands the wasting action of the fire; all of which qualities endear it to the English locomotive engineer, regardless of its first cost."

Edgar Worthington, Secretary of the Institution of Mechanical Engineers, London, writes, "The advantages claimed for copper over steel fireboxes are: Less tendency to cracking of the plates, which takes place in steel fireboxes if the material is not of exactly the right quality. Copper also has an advantage in taking up contraction strains when the boiler is cooled down either for washing out or for repairs. It was claimed in 1895 that the time the engine was out of service while fixing the new steel firebox was longer than for fixing a copper box. The result of experiments made on the G. S. and W. Ry. of Ireland with English and American steel plates, and on the N. L. Ry., the G. E. Ry., the L. & N. W. Ry., and the Compagnie du Nord tended with one or two exceptions to the abandonment of steel fireboxes in Europe."

Mr. Brocklebank suggests that "In view of the fluctuations in value of copper in recent years, it might be possible to obtain a bigger price for the old copper than that originally paid for the new copper."

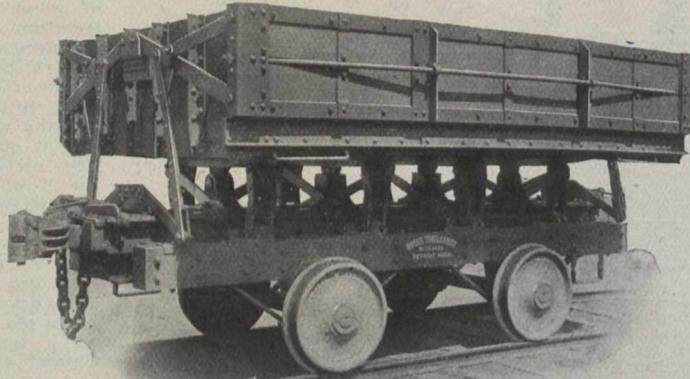
SUMMARY.—The initial cost of a copper firebox is much higher than steel. The life cost, allowing for the value recovered on the scrap copper, of copper and steel is about equal. Copper sustains mechanical work better, and makes stronger and tighter joints than steel. It takes up sudden fluctuations in temperature more quickly and uniformly. Copper offers greater resistance to corrosion than steel. Therefore, engines fitted with copper fireboxes should spend less time in shop directly consequent to firebox trouble, and be less liable to failure on the road from leaking of stays and tubes, and cracking of plates.

The foregoing paper was read before the Western Canada Railway Club recently.

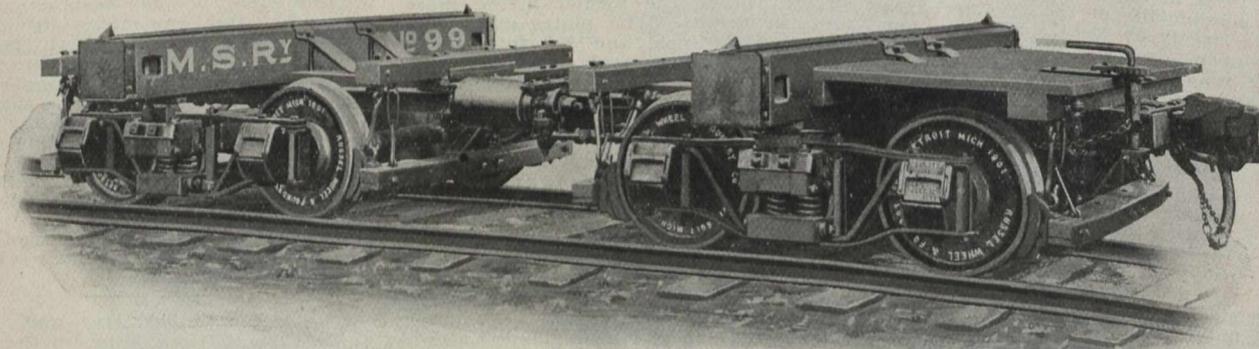
The Intercolonial Ry. and Branch Lines.—The bill providing for the leasing by the Minister of Railways of branch lines connecting with the Intercolonial Ry. is under consideration by the House of Commons. The bill provides that upon the recommendation of the Government Railways Managing Board the Minister may lease any such line which is found to be in a safe and proper condition for operation, the lease not to be operative until confirmed by Parliament. The bill was read a second time Dec. 8, and subsequently was passed through committee.

Toronto Viaduct Question.—The appeal against the order of the Board of Railway Commissioners directing the construction by the railway companies of a viaduct along the waterfront of Toronto came before the Supreme Court at Ottawa, Nov. 25. Arguments were concluded Dec. 3, and judgment reserved. In an interview in Toronto, Dec. 4, J. W. Leonard, General Manager C.P.R. Eastern Lines, said the railways would fight the issue to a finish. They did not contemplate abandoning their present lines on the waterfront.

Russel Heavy Duty Dump Cars



The only dump car built that will stand the severe service of the heaviest steam shovels. Acknowledged by the operator to be the best car on the Mesaba Range. : : :



RUSSEL LOGGING CARS

Superior in design. Built to accommodate any length of logs and of any capacity desired. : : : :

RUSSEL WHEEL & FOUNDRY CO.

Detroit, Mich., U.S.A.

RAILWAY DEVELOPMENT.

Projected Lines, Surveys, Construction, Betterments, Etc.

The Alberta Ry. and Irrigation Co. during 1909 laid eight miles of new track from Raley to Woolford, Alta., this is a branch line from the old St. Marys River Ry., which runs from Sterling, on the main line from Lethbridge to Coutts. (Oct. 1909, pg. 743.)

Algoma Central and Hudson Bay Ry.—We are advised Dec. 14 that the surveys had not been completed for the line connecting the Michipicoten branch with the C.P.R. It is expected to call for tenders for the construction of the section of the line from Hawk Lake Jct., on the Josephine branch, to the C.P.R. transcontinental line at Hobon, Ont., about 29 miles. It is expected that a very favorable line will be secured, with a maximum gradient of about 0.6% and a maximum curvature of six degrees. There will be no large bridges or water crossings of any magnitude. No decision has been reached with regard to starting construction on the completion of the main line from the present end of track, mileage 69.33 to Hawk Lake Jct., a distance of 95.15 miles. (Dec., 1909, pg. 881.)

The Atlantic, Quebec and Western Ry. Co. entered into a contract with the Dominion Government Oct. 30, 1909, in respect of the construction of 26 bridges on the line from Paspébiac to Gaspé, Que. During 1909, 36 miles of track was laid as follows:—from Port Daniel to Grand Pabos, 20 miles; from Grand Pabos to Grand River, 10 miles; and from Gaspé to Douglastown, six miles. The portion of the line between Grand River and Douglastown, 46 miles, is under construction, the contractor being the New Canadian Co., Gaspé, Que. W. L. Browne is Chief Engineer in charge of construction.

We were advised Dec. 11 that a further two sections of this line had been inspected by the Dominion Government engineers and it was expected to have them open for traffic by Dec. 31. The temporary terminal station will be Newport, mileage 37, for passenger, and Pabos, mileage 42, for freight traffic. The work which will be carried on during the winter will be the erection of the different steel superstructures, the one for the crossing of Grand Pabos River being the first taken in hand. The steel is being manufactured by the Dominion Bridge Co.

Bay of Quinte Ry.—Application is being made to the Dominion Parliament to authorize the company to construct a branch from Bridgewater, to near the Actinolite mines, Ont., about 15 miles, and to extend the time for the completion of the previously authorized lines.

British Columbia and Manitoba Ry.—See Northern Empire Ry. on pg. 21, this issue. (Dec., 1909, pg. 831.)

The Canada and Gulf Terminal Ry. Co. has under construction the section of its line from St. Flavie, Que., the point of junction with the Intercolonial Ry., to Matane, 35.5 miles. Considerable work has been done, and we are advised that track laying will be proceeded with in the spring. It is expected to have this portion of the line opened for traffic about Sept. 1. The contractor is H. Doheny, Montreal. The company has power to construct the following additional lines:—from Matane to Gaspé Basin, 150 miles; and from St. Flavie to Pohemagamook, on the National Transcontinental Ry., 100 miles. (Nov., 1909, pg. 829.)

Diamond Ry. and Coal Co.—We are advised that this company's recently completed line connects with the C.P.R. at Kipp station, six miles west of Lethbridge, Alta., on the new cut-off between MacLeod and Lethbridge. From

Kipp to Diamond City, where the line terminates, is a fraction under six miles; the gradient is not over 1%, and the curvature not more than 20 degrees at any point. The contractors for construction were Cazier Bros., Cardston, Alta., and — Medley, Calgary, was engineer in charge. The officers of the railway company are: President and Manager, T. Underwood, Calgary; directors: Hon. G. H. V. Bulyea, Edmonton; G. F. Stephens and C. W. Clarke, Winnipeg. We are informed that it is quite possible the railway will be transferred to the Diamond Coal Co., of which T. W. Underwood is Managing Director and Secretary-Treasurer. The line is being used for the carrying of coal from the Diamond Coal Co.'s mine at Diamond City. (Nov., 1909, pg. 829.)

Dominion Atlantic Ry.—The construction of a branch line from Centreville, N.S., on the Cornwallis Valley branch, was under discussion, between a deputation from the district through which the branch will run and the management, Dec. 3, 1909. General Manager Gifkins stated that the line would be constructed, and it was probable work would be started in the spring. The line will run west from Centreville and extend to Somerset, passing through a large fruit growing district. It is hoped to complete the first 10 miles during the year.

The Dominion and Provincial Governments have voted subsidies at the usual rates. (Dec. 1909, pg. 881.)

Eastern Townships Ry.—The Dominion Parliament is being asked to extend the time within which the company may construct the line of railway it is authorized to construct by sec. 8, chap. 84 of the statutes of 1907. (Nov., 1909, pg. 829.)

Gatineau and Ungava Ry.—The Dominion Parliament is being asked to incorporate a company with this title with a capital of \$2,000,000, to construct a railway, from the National Transcontinental Ry. near the height of land in Quebec, to Lake Chibougamau, 140 miles, thence to the east side of Lake Mistassini, 40 miles, and to the northern boundary of the province of Quebec, or border of the territory of Ungava, at Homani, or Summit Lake, a distance from the starting point of about 400 miles; thence turning round the headwaters of Big River to Lake Kaniapiskau, near the intersection of the 70th meridian and the 54th parallel; thence north-westerly, crossing the source of the Stillwater River to Lake Minto or Leaf River, or northerly on Kokseak River, and from either point north-easterly to Leaf Lake on Ungava Bay, a total of about 800 miles. The company also asks power to acquire steam and other vessels, to construct wharves, docks, telegraph and telephone lines, and to carry on general mining development and business operations along the line. Brooke, Chauvin and Devlin, Hull, Que., are solicitors for applicants.

Graham Island, B.C.—Application is being made to the British Columbia Legislature to incorporate a company to construct a railway on Graham Island, commencing at Queen Charlotte township, on Skidegate Inlet, northerly along Honna River and its tributaries and the Yakoun River, to Masset Inlet, near the mouth of the Yakoun River. The company also asks power to construct wharves, docks, etc.; to generate and dispose of electric power; to carry on a general navigation business, and to construct telegraph and telephone lines. F. Higgins, Victoria, is solicitor for applicants. (See Graham Island, B.C., Dec., 1909, pg. 881.)

Graham Island Ry.—The British Columbia Legislature is being asked to extend the time for the deposit of security and construction of that projected rail-

way. R. C. Lowe, Victoria, B.C., is agent for applicants. (Aug., 1909, pg. 573.)

Ha Ha Bay Ry.—We are advised that track has been laid from St. Alphonse, on the Saguenay River, to Jonquières, on the Quebec and Lake St. John Ry., two miles, and that the construction of a further 25 miles inland is being proceeded with. The contractors are O'Brien, Payne and Jennings, and J. F. Grenon is Chief Engineer in charge of construction.

The officers and directors are:—President, Hon. A. Choquette, Quebec; Vice-President, J. E. A. Dubuc, Chicoutimi; Secretary, J. H. Parlard, Chicoutimi; other directors:—H. Einon, A. Lepage, W. Levesque, E. Bolvin, R. H. Beaulieu, S. Lapointe, J. E. Cloutier, Bagotville, Que. (Dec., 1909, pg. 883.)

Intercolonial Ry.—We are advised that the work which has been in progress for the last three years on the section between Blackville and Indian-town, N.B., has been completed and the line is now being operated. A diversion of 2,000 ft. was made at White Rapid Brook to improve the alignment, and 2,803 ft. of track was put in at Renous bridge and Blackville. The bridges have all been strengthened, and, in some cases reconstructed.

With reference to the proposed diversion from Sydney Mines to George's River, N.S., we are advised that revised location surveys have been made, but no decision reached when work is to be started.

As to the proposed diversion at Chatham, N.B., we are advised that the final location surveys are being made. (Dec., 1909, pg. 883.)

International Ry. of New Brunswick.—A press report states that the grading on this line was completed into St. Leonards, N.B., Dec. 10, and that it was expected to have track laying practically completed by Dec. 31. (Dec., 1909, pg. 883.)

Kamloops and Yellow Head Pass Ry.—Application is being made to the Dominion Parliament for an act extending the time within which the company may construct the line of railway authorized by its act of incorporation, chap. 115 of the statutes of 1906, as amended by chap. 120 of the statutes of 1908. This latter statute is to be repealed by the new act. (Nov., 1909, pg. 829.)

Kettle Valley Lines.—We are advised that the company is considering the construction of additional lines, from Midway to Nicola, B.C., 150 miles; and from Republic, to Spokane, Wash., 120 miles. The first named is to be constructed under the contract with the B. C. Government, which will come up for ratification at the approaching session of the Legislature.

The company is applying to the Dominion Parliament for an extension of time for the commencement and completion of the various lines authorized, and for authority to construct an additional line from Coldwater to the navigable waters of the Fraser River. This line is part of that to be constructed under the agreement with the B. C. Government. (Dec., 1909, pg. 883.)

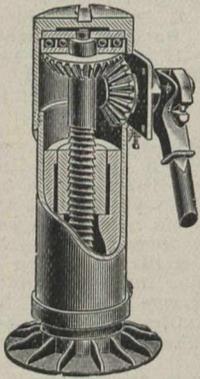
London and Port Stanley Ry.—The directors have recommended the London, Ont., city council to permit the Pere Marquette Rd., lessee of the L. and P. S. Ry. to construct a siding on the north side of Bathurst St., from the freight sheds, across Burwell St. to Maitland St. The conditions attached to the permission are that the company shall indemnify the city against actions for damages arising from the presence of the siding, and that it shall become the property of the city when the P. M. Rd. lease expires. (July, 1909, pg. 477.)

Lytton to Teslin Lake.—Application is being made to the British Columbia

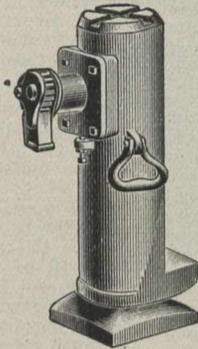
NORTON JACKS

Are Made in Canada and Save You Delay and Duty on American Made Jacks.

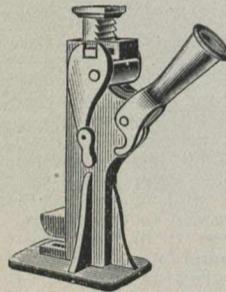
50 Styles 8 to 100 Tons Capacity
Carried in stock for IMMEDIATE DELIVERY



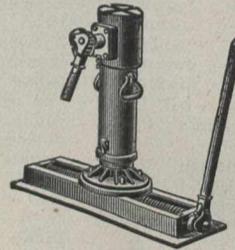
Sectional View



Foot Lift Jack



15 Ton Track Jack



Traversing Jack



Journal Jack

MANUFACTURED BY

A. O. NORTON, COATICOOK, QUE.

Stock Carried by MUSSENS LIMITED, Montreal and Winnipeg

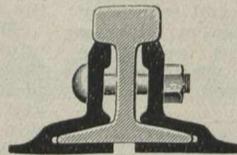
ADDITIONAL SAFETY AND ECONOMY IN

TRACK MAINTENANCE

has been proved by the use of Continuous, Weber and Wolhaupter base-supported rail joints—after fourteen (14) years' service, having a record of over **50,000 miles in use**—the extent of which is evidence of their excellence.

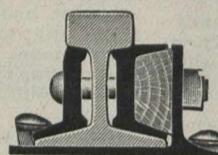
HIGHEST AWARDS

Paris, 1900;
Buffalo, 1901; St. Louis, 1904



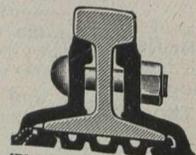
Continuous Joint

Over
50,000
miles
in use



Weber Joint

Rolled
from Best
Quality
Steel



Wolhaupter Joint

Catalogues at Agencies

Baltimore, Md.
San Francisco, Cal.

Boston, Mass.
Seattle, Wash.

Chicago, Ill.
St. Paul, Minn.

London, E. C., Eng.

Denver, Colo.
St. Louis, Mo.
New York City.

Pittsburg, Pa.
Troy, N.Y.

THE RAIL JOINT COMPANY OF CANADA, LIMITED

OFFICES: BOARD OF TRADE BLDG., MONTREAL, CAN.

Makers of Base Supported Rail Joints for Standard and Special Rail Sections, also Girder, Step or Compromise, Frog and Switch, and Insulating Rail Joints, protected by Patents.

Legislature to incorporate a company to construct a railway from Lytton, along Fraser River Valley through Lillooet to near Fort George, thence following Stuart River Valley, Stuart Lake, Tacla and Middle Rivers to North Tacla Lake, thence following the Stickle River to Telegraph Creek, and northerly to Teslin Lake, on the northern B. C. boundary. The company also asks power to construct wharves and docks; to carry on a general navigation business; to construct telegraph and telephone lines, and to generate and dispose of electricity. Barnard and Robertson, Victoria, are solicitors for applicants.

Manitoulin and North Shore Ry.—Construction was started on the eight mile extension from Gertrude mine to Crane Hill mine near Sudbury, Ont., in July, 1909, at station 738, a mile south of Gertrude, and we are advised that at the end of Nov. the grading to station 830 had been completed, with the exception of a trestle 500 ft. long. Work was started on this trestle early in Dec., all the material being on the ground, and it is expected to have it, together with all the grading to station 935, completed and ready for track by Jan. 31. This will bring the construction to near the Vermillion River. The abutments for the bridge across this river are under construction. From the opposite bank of the river to Crane Hill, grading is under way and it is hoped to have it all ready for track laying by April 1. The only difficulty in the way of completing the work as desired is labor. At present the supply is not abundant.

We are advised that the company has laid tracks from mileage 13 to 14.14 west of Sudbury and that the total length of the extension now being constructed by the O'Boyle Construction Co. is 9.68 miles. Surveys have been made for an extension from the end of the mileage at present under contract to mileage 81.3.

The Dominion Parliament is being asked to extend the time for the construction of the line from Sudbury to Little Current, on Manitoulin Island, (partially constructed); the line between Meaford and Owen Sound, Ont.; and the following:—from near Elsie mines north-easterly for 50 miles to Lake Timagami; from the line in Drury or Hyman tp., to Lake Superior, between Michipicoten harbor and Batchawana Bay; from Bothwell tp. to MacLennan tp.; from Little Current, northerly and easterly for 100 miles, crossing the C.P.R. at or near Onaping or Cartier (except that portion of such line between Little Current and Sudbury); from Drury or Hyman, easterly to Sudbury; from Little Current, to the south shore of Manitoulin Island or Fitzwilliam Island; and from Tobermore, Bruce county, passing through Wiarton to Owen Sound. It is also desired to have it declared that the company's lines are works for the general advantage of Canada.

Margaree Coal and Ry. Co.—We are advised that a contract has been entered into between the Nova Scotia Government and the M.C. and R. Co. for the construction of a line from Chimney Corner Cove, via St. Rose to South West Margaree and thence by the east side of Lake Ainslie, passing west of Whycomagh, to the Intercolonial Ry. near Orangedale station; and also from the Intercolonial Ry. near McIntyre's Lake to Habitant Bay or River. The total distance is not to exceed 51 miles. Surveys were made for these lines about a year ago, but no construction has been done. Arrangements are being made, we are advised, for the letting of a contract for construction to C. J. Wills and Sons, London, Eng., and that it is possible construction will be started in the spring. W. B. McDonald, Halifax, N.S., is President, and A. G. Morrison, Secretary. (Dec., 1909, pg. 883).

Menzies Bay to Quinsan River.—The British Columbia Legislature is being asked to incorporate a company to construct a railway from Menzies Bay, Vancouver Island, either north or south of Trout Lake, to the junction of Salmon River and Mamekay River, and from Menzies Bay to the point where the Quinsan River touches the south-east corner of lot 81, near the 50th parallel of north latitude. The line is to be operated by steam, electricity or other motive power, and is for logging traffic, but a section of the bill gives power to convert the proposed railway into a regular line for the conveyance of freight and passengers. The company also asks power to construct docks, and to operate steam and other vessels, as well as for various other powers. Wilson and Blomfield, Vancouver, are solicitors for applicants.

Montreal Central Terminal Co.—Application is being made to the Dominion Parliament for an act extending the time when this company may construct the various works which it is authorized to construct. Power is also being asked to amalgamate with the Canadian Northern Ontario Ry., the Ottawa Valley Ry., the Carillon and Grenville Ry., the Boston and Maine Rd., the Chateaugay and Northern Ry., the Montreal Terminal Ry., the Montreal Suburban Ry. and the Intercolonial Ry. The company also asks for power to acquire the franchises of certain power companies and to issue fully paid-up shares in payment for the same and for services rendered; to make agreements with telegraph and telephone companies, and with the city of Montreal. (Dec., 1909, pg. 883).

Montreal, Kapitawagan and Rupert's Bay Ry.—Application is being made to the Dominion Parliament to incorporate a company to construct a railway from Rupert's Bay northeasterly to Lake Kapitawagan, crossing the G.T.P.R., thence to Montreal; to construct telegraph and telephone lines, hotels, wharves, docks, grain elevators, etc., and to operate steam and other vessels; to generate electric power; and to connect and make agreements with other railways. P. Rainville, Montreal, is solicitor for applicants.

Nelson River Ry.—The Dominion Parliament is being asked to pass an act incorporating a company with this title for the purpose of constructing a railway from Lake Winnipeg, near its outlet into the Nelson River, or near the discharge of the Saskatchewan River into Lake Winnipeg, or from a place between these two points, to a junction with any railway to Hudson Bay which may be located by the Dominion Government. The company is asking for navigation and other powers to enable it to develop the country which it will traverse, and especially for power to construct tramway lines at points on the Nelson and Saskatchewan rivers where necessary to transport freight and passengers round any rapids. The offices are to be at Winnipeg; its capital will be \$500,000, and it may issue bonds to the amount of \$30,000 a mile of railway. The provisional directors are:—T. Malcolm, Campbellton, N.B.; C. Riordan, Hawkesbury, Ont.; R. C. Smith, J. J. Westgate, Montreal; W. H. Truman, Winnipeg; and W. Rigby, London, Eng. (Nov., 1909, pg. 829).

Northern Empire Ry.—The following press dispatches were sent from Edmonton, Alta., Dec. 16: "During the past two days plans have been formulated which will result in the carrying out of the biggest railway project yet planned in the west. The project is backed by millions, and will open up Athabasca and Peace River sections to a great extent. The charters granted to the Northern Empire Ry. Co. and the Manitoba & British Columbia Ry. Co. have been transferred to a new company, headed by Henry Roy,

a millionaire. The newly-organized company is capitalized at \$4,500,000. It will ask for a guarantee of bonds by the Government for the construction of a line north and south of Edmonton."

The Northern Empire Ry. Co. was incorporated by the Dominion Parliament in 1908, H. Roy, being one of the provisional directors. The British Columbia and Manitoba Ry. is the new name given to the Crawford Bay and St. Marys River Ry. incorporated by the Dominion Parliament in 1904, H. Roy being one of the provisional directors. Notices were issued calling meetings of shareholders at Edmonton, Alta., for the N. E. Ry., and at Lethbridge for the B. C. and M. Ry., early in Nov. Subsequently these notices were withdrawn and new dates fixed for the meetings, that for the N. E. Ry., being fixed for Dec. 15, at Edmonton; and that for the B. C. and M. Ry. for Dec. 18, at Lethbridge. (Dec., 1909, pg. 833.)

Northern New Brunswick and Seaboard Ry.—We are advised that track has been laid upon four miles of the line being constructed from Nipisiquit Jet., on the I.C.R., four miles south from Bathurst, N.B., towards the Canada Iron Corporation's mines. The ballasting upon this mileage has been partly completed. Track laying was gone on with until the weather caused work to be closed down for the season. Grading has been completed to the mines, a distance of 17 miles from the junction with the I.C.R., and it is expected that the line will be completed and ready for operation by May 15. The company has also completed the construction of a mile of track from Newcastle station, on the I.C.R., to its ore dock site, and is now proceeding with the construction of the ore discharging plant. (Nov., 1909, pg. 829).

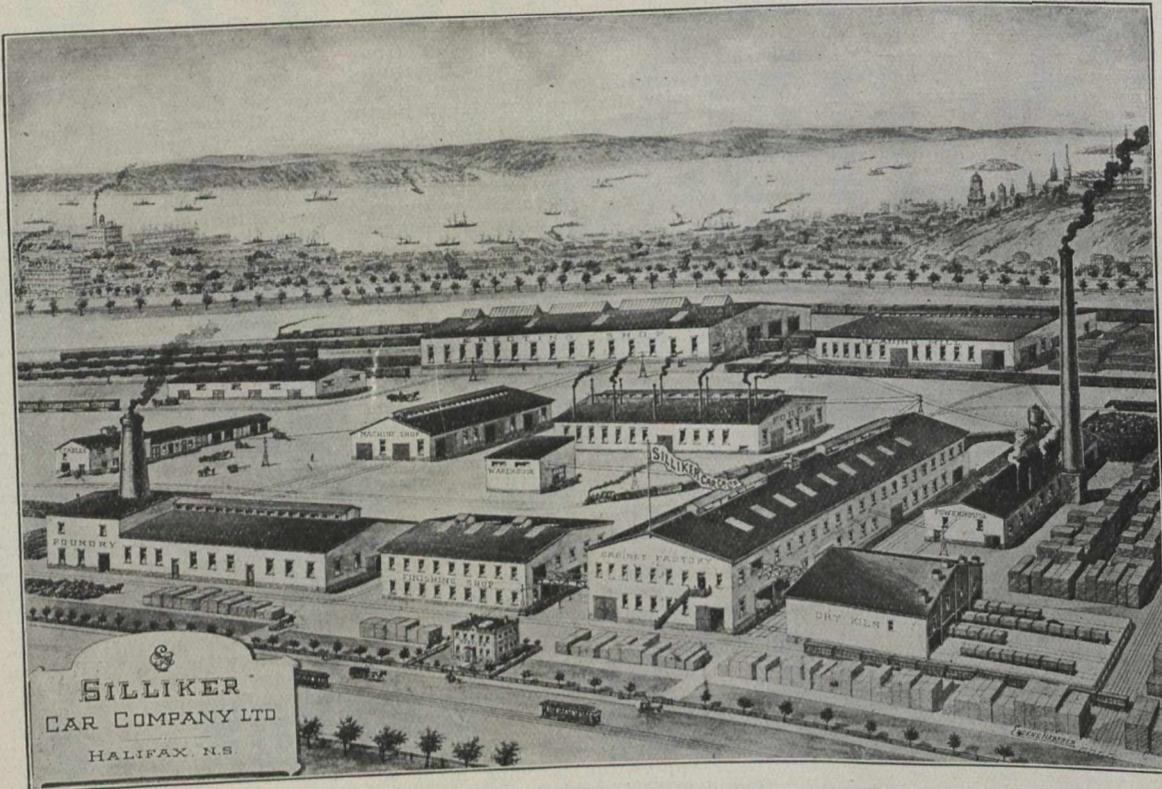
Northern Quebec Colonization Ry.—Application is being made to the Dominion Parliament for the incorporation of a company with this title with power to construct a railway commencing at Tadousac, at the mouth of the Saguenay River, thence north-westerly along the north shore of the Saguenay River to between Lake Chibougamau and Lake Mistassini, thence north-westerly to Hannah Bay, Ont., with a branch line from Lake Chibougamau to Weymontache, on the National Transcontinental Ry. The company is also asking power to acquire steam and other vessels and to enter into arrangements with other companies. Smith and Johnston, Ottawa, are solicitors for applicants.

Ottawa, Montreal and Eastern Ry.—Application is being made to the Dominion Parliament for the incorporation of a company with this title to construct a railway from the shores of Lake Megantic, Compton County, Que., to Montreal, crossing the St. Lawrence River at Longueuil, with power to construct a bridge over, or a subway under, the river; and to continue the line westerly from Montreal to Ottawa through Prescott, Russell and Carleton counties in Ontario; with power to construct branch lines to Arthabaska, Victoriaville, and Yamaska, Que. LaFlamme, Mitchell and Chenevert, Montreal, are solicitors for applicants.

Ottawa Valley Ry.—The Dominion Parliament is being asked to authorize the company to enter into agreements with the Canadian Northern Ontario Ry., the Canadian Northern Quebec Ry., and the Central Ry. Co. of Canada, or either of them; and also for power to issue bonds or other securities for \$30,000 a mile of single track, and \$15,000 for each mile of second track; to generate and distribute, gas and electric, or other power and energy; and to operate hotels, parks and places of amusement at any point on its railway, and to issue bonds to cover the cost of same.

SILLIKER CAR COMPANY, LIMITED, HALIFAX, N. S., CANADA

STREET RAILWAY CARS



HEAVY FORGINGS AND CASTINGS

RAILWAY, FREIGHT AND PASSENGER CARS OF ALL KINDS

Pintsch Light

Steam Heat

Most brilliant illumination made possible by the Pintsch System using perfected Mantle Lamps and Safety Axle Driven Dynamo Electric System a product of sixteen years experience and now operating successfully on leading roads



Car Heating Systems guaranteed to meet all conditions of service. Controllable Direct Steam, Hot Water or Thermo Jet System where pressure not desired. Steam tight couplers, traps, train pipe valves and other appliances.

CHICAGO. BOSTON. ST. LOUIS. ATLANTA.

PHILADELPHIA. MONTREAL. BERKELEY, CAL., C

Pacific Coast Coal Mines, Ltd.—We are advised that the company has constructed a line from Fiddicks Jct., on the Esquimalt and Nanaimo Ry., to Boat Harbor, about eight miles below Nanaimo, B.C. The line is approximately 5.5 miles long, and there is under construction an extension of 1.5 miles from Fiddicks Jct. to the company's mine at South Wellington. So far as future extensions are concerned, the company is at present developing a coal property at Suquash, in Rupert district, and it is possible that further railway construction will be necessary as this development proceeds. The line at present constructed is used solely for the purposes of the mine. The officers and directors are:—President, J. Arbutnot, Victoria; Vice-President, L. D. Wishard, New York; Managing Director, S. H. Reynolds, Victoria; Secretary-Treasurer, J. M. Savage, Victoria; other directors, W. J. Moran, C. C. Michener and M. Hodgson. (April, 1909, pg. 249).

Pine Pass Ry.—Application is being made to the Dominion Parliament for the incorporation of a company with this title to construct a railway from Edmonton, Alta., north-westerly to the confluence of the MacLeod with the Athabasca river, thence continuing north-westerly to Pouce Coupe Prairie, and thence south-westerly to Fort George on the Fraser River, B.C. The company also asks for power to acquire and navigate steam and other vessels on any navigable waters touched by its line, and to amalgamate with the C.P.R., the Canadian Northern Ry., the Saskatchewan Valley and Hudson Bay Ry., or the Prince Albert and Hudson Bay Ry. The offices are to be at Edmonton, Alta.; its capital will be \$1,000,000 and it may issue bonds for \$50,000 a mile. The provisional directors are:—M. Kimpe, J. Smith, A. R. Chisholm, T. W. Lines and B. J. Saunders, Edmonton. (Nov., 1909, pg. 829).

Port Moody to Indian River, B.C.—The British Columbia Legislature is being asked to incorporate a company to construct a line of railway to be operated by steam, electricity or other motive power, from Port Moody to the north shore of Burrard Inlet, thence along the north shore of the inlet to lot 256, thence westerly or north-westerly to the north arm of Burrard Inlet, thence along the eastern shore of the north arm to the mouth of Mesliloret or Indian River, B.C.; and branch lines, not to exceed 20 miles in length in any one case. Davis, Marshall and Macneill, Vancouver, are solicitors for applicants.

Prince Albert and Hudson Bay Ry.—Application is being made to the Dominion Parliament to change the route of the line as originally projected, increase the bonding powers, and to extend the time for the commencement and completion of the lines. (Nov., 1909, pg. 829).

Prince Edward Island Tunnel.—A copy of all memorials, reports, correspondence and documents in the Government's possession not already brought down, relating to a survey of a route for a tunnel under the Northumberland Straits between the mainland and Prince Edward Island, and also relating to the construction of such a tunnel has been ordered to be made for the House of Commons. The object of the motion calling for the return was, that a case might be made out for the ordering of a survey which would finally settle the practicability or otherwise of the construction of a tunnel. It was pointed out that previous surveys showed the possibility of construction, but that before final estimates were made borings from the bed of the strait should be taken to ascertain definitely the geological formation, and the quantity of water likely to be encountered. (Dec., 1909, pg. 805).

Quebec Central Ry.—The extension from St. George Beauce to St. Justine, 30 miles, was practically completed on Dec. 15, track being laid up to St. Justine, the 28th mile. The stations are in course of erection and regular train service between St. George and St. Justine will be established on Jan. 1. The season being so late the line could not be fully ballasted but ballasting will be completed early next spring. Powers & Dessault, Levis, Que., are the contractors.

The further location of the line in the direction of Cabano is being proceeded with. J. T. Morkill, Chief Engineer, with a party is on the survey and 10 miles are already located, a very favorable line being found. It has not been decided what amount of construction will be proceeded with this year. (Dec., 1909, pg. 225.)

The Reid-Newfoundland Co. has entered into a contract with the Newfoundland Government to construct five branch railways, the total length of which will be nearly 300 miles. They will extend from the main line to different points on the coast as follows:—from Shoal Harbor to Bonavista Bay, about 75 miles; from Broad Cove to Heart's Content and Grete's Cove, about 62 miles; from Ransford Bridge to Trepassey, about 70 miles; from Country Chance to Fortune Bay, about 48 miles, and from Bay of Islands to Bonne Bay, about 42 miles. The gauge will be the same as the R.N. Co.'s other lines, viz., 3½ ft., and 50 lbs. rails will be used. The company has already graded about 22 miles of the Bonavista branch and will take out the necessary ties this winter. The company has also entered into a contract for the operation of all branches mentioned as they are completed, receiving therefor a subsidy of 4,000 acres of land per mile. (Dec., pg. 885.)

Salmon River, B.C.—Application is being made to the British Columbia Legislature to incorporate a company with power to construct a railway to be operated by steam, electricity or other motive power, from where the Salmon River crosses the International boundary between British Columbia and Alaska, to the source of the river, and such branch lines as may be necessary. Wade, Wheeler and McQuarrie, Vancouver, are solicitors for applicants.

Saskatchewan Central Ry.—Application is being made to the Dominion Parliament to incorporate a company with this title to construct a railway from tp. 41, range 3, west of the second meridian, westerly to Battleford, Sask., thence north-westerly to Smoky Lake, Alta., thence south-westerly to Edmonton; with power to construct branch lines as follows:—from near the starting point of the line, northerly to where the Saskatchewan River intersects the easterly boundary of the Saskatchewan; also from near the starting point of the line through Canora and Yorkton to North Portal; from tp. 43, range 21 west 2nd meridian north-westerly to Prince Albert, Sask., and from the same starting point southerly through Regina to the southern boundary of Saskatchewan, between ranges 18 and 20; and from the same starting point north-easterly to where the Saskatchewan River crosses the eastern boundary of the province; from near Battleford northerly to Meadow Lake, Sask.; from tp. 42, range 25 west of 2nd meridian, south-westerly through Saskatoon to the southern boundary of the province between ranges 10 and 21; from tp. 18, range 14, west 3rd meridian, westerly to the Saskatchewan River, and thence south-westerly to Lethbridge, Alta. The company is asking for all the usual powers, and for authority to enter into agreements with other railway companies. Smith and Johnston, Ottawa, are the solicitors.

The Temiskaming and Northern Ontario Ry. Commissioners have under survey a branch line from Charlton to Gowganda, Ont., 50 miles. The question of construction will not be settled for some time, as the Legislature has to approve and the Commission is not desirous of recommending its construction until fully convinced of the possibilities of traffic from the district to be opened up.

Tenders were received to Dec. 31 for the grading required in the construction of a second track between Cobalt and North Cobalt, two miles. The other work proposed to be done during the winter includes the completion of stations at Cobalt and Cochrane. (Dec., 1909, pg. 885).

Toronto Central Terminal Co.—The application to the Dominion Parliament for the incorporation of a company with this title, signed by P. Howland, Toronto, and others, has been presented to the House of Commons, and is passing through the usual routine. The Mayor of Toronto has received a letter from the solicitors of the company expressing a desire to obtain the fullest information as to the present and future requirements of the city and its environs in the way of freight and passenger terminal facilities, and as to the cheapest and most expeditious mode of transferring freight between different parts of the city. The company is said to have secured the services of engineers of experience in the matter of laying out terminals who are making surveys with a view to preparing plans, and desires to have all the information available, so that plans to the advantage of all interests may be drawn up. The city council has decided to oppose the bill. (Dec., 1909, pg. 914).

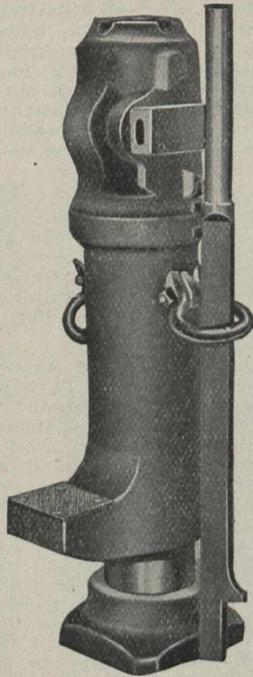
Vancouver to New Westminster, B.C.—Application is being made to the British Columbia Legislature to incorporate a company to construct a railway from Vancouver to New Westminster, B.C. Abbott and Hart-McHarg, Vancouver, are the solicitors.

Vancouver to Upper Lillooet Lake.—Application will be made to the British Columbia Legislature to incorporate a company to construct a railway, to be operated by electricity, steam or other motive power, from Vancouver to Upper Lillooet Lake, either by way of Stave Valley or Harrison River Valley, with power to construct branch lines to points not more than 30 miles distant. It is also desired to have power to construct wharves, docks, and operate steam and other vessels. Barnard and Robertson, Victoria, are the solicitors.

Western Alberta Ry.—Application is being made to the Dominion Parliament to extend the time for the commencement and completion of the authorized line of railway. Beaton and Shapley, Toronto, are the solicitors. (July, 1909, pg. 483).

Western Canada Power Co.—The Dominion Parliament is being asked to enlarge the scope of the company which was incorporated under the Dominion Companies Act, so as to enable it to construct such railways, and branches, side-tracks, turnouts, tramways, and telegraph and telephone lines, and works in connection therewith, as may hereafter be authorized by legislation or other authority. C. H. Cahan, Ottawa, is the solicitor.

Winnipeg City Power Plant Line.—We are advised that during 1909 the Commission laid track on 25.25 miles of its line as follows:—from Lac du Bonnet to Pointe du Boise, 24 miles; and from station 1187 to gravel pit, 1.25 miles. It has under construction a line, 0.93 mile, from station 1217 to the power house. The contractor is O. E. Anderson, Winnipeg. (Feb., 1909, pg. 105).

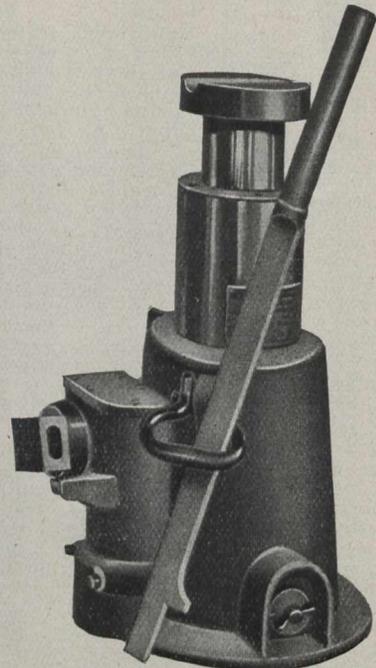


Inside Pump Type

Quick Action Hydraulic Jacks

Joyce-Cridland Hydraulic Jacks have a speeding device whereby they can be run quickly up to load, where the speeding device automatically cuts out, leaving only the power pump in action. This device adds no extra pump or complicated parts to the jack. These jacks are so built that they may be used in any position and the filling liquid will not escape. The outside pump type has a short barrel, adapting it for use in cramped quarters.

Full description and explanation of the working parts of the Joyce-Cridland Hydraulic Jacks are given in Bulletin 33.



Outside Pump Type

A. R. Williams Machinery Co., Limited

Toronto, Winnipeg and Vancouver. WILLIAMS & WILSON, Montreal

CANADA CAR COMPANY

MONTREAL, QUE.

LIMITED

MANUFACTURERS OF

RAILWAY FREIGHT AND PASSENGER CARS

OF ALL DESCRIPTIONS

CAR WHEELS

CASTINGS

FORGINGS

AND ALL NECESSARY EQUIPMENT FOR
CAR CONSTRUCTION

Cars Built to Standard Designs or to Customers' Specifications

P.O. ADDRESS:
BOX 2286, MONTREAL

Works: TURCOT

Orders by the Railway Commissioners.

Beginning with June, 1904, we have published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearing took place and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the date assigned to them.

8680. Nov. 4.—Ordering that C.P.R. forthwith erect shelter on or near wharf at East Robson, B.C. for protection of merchandise from weather.

8681. Nov. 8.—Dismissing application of town of Lemberg, Sask. for authority to open Main St. across C.P.R.

8682. Nov. 4.—Dismissing complaint of A. E. Watts, Cranbrook, B.C., with regard to inflammable material left on railway right of way and the destruction of public roads, including those from Yahk to Copeland and Sicamous to Vernon, B.C.

8683. Nov. 4.—Dismissing complaint of Kootenay Shingle Co., Salmo, B.C., that C.N.R. has departed from tariffs fixed by Board with respect to rates, weights, and shortage on shipments of shingles originating at Salmo and consigned to points in B.C., Alberta and Ontario.

8684. Nov. 18.—Authorizing East Luther and Amaranth Telephone Co. to install telephone instrument in C.P.R. station, Grand Valley, Ont.

8685. Feb. 5.—Authorizing city of Winnipeg, to construct subway under its tracks on east side of McPhillips St., between Fonseca Ave. and Jarvis St.

8686. Nov. 18.—Authorizing G.T.P.R. to put on a tri-weekly mixed train service between Wainwright and Edmonton, Alta.

8687. Nov. 18.—Authorizing city of Brantford, Ont., to lay sewer pipe under T.H. & B.R. at Gilkinson St.

8688. Nov. 18.—Authorizing Farmers' Telephone Co. to erect wires across C.P.R. in Northampton parish, Carleton Co., N.B.

8689, 8690. Nov. 18.—Authorizing Farmers' Telephone Co. to erect wires across C.P.R. at Brighton and Hartland, N.B.

8691. Nov. 18.—Authorizing C.N.R. to open for traffic the portion of its line from Saskatoon to Rosetown, Sask., 72 miles.

8692, 8693. Nov. 17.—Authorizing C.P.R. to construct a 3-track spur across road allowance between secs. 22 and 23, tp. 24, r. 9, w. 5th mer. and five other spurs near Exshaw, Alta., and a system of industrial spurs for International Elevator Co., St. Boniface, Man.

8694. Nov. 18.—Authorizing C.P.R. to open for traffic the extension of its Snowflake Branch to Windygates, mileage 0 to 6.5, Man.

8695. Nov. 18.—Recommending to Governor in council for sanction, agreement between C.N.R. and Northern Extension Ry.

8696. Nov. 15.—Authorizing Winnipeg Electric Ry. to operate cars over C.P.R. crossing at Logan Ave. for a further two months without being brought to a stop.

8697. Nov. 18.—Authorizing C.P.R. to construct spurs across Ross Ave., Xante St. and over blocks 89, 90, 91 and 92, lot 9, Winnipeg.

8698, 8699. Nov. 18.—Authorizing city of Toronto to lay ducts under G.T.R., C.P.R., near Strachan Ave., and on Strachan Ave., northern crossing.

8700, 8701. Nov. 18.—Authorizing village of Brussels, Ont., to erect wires across G.T.R.

8702, 8703. Nov. 18.—Authorizing Horton & McNab Telephone Co. to erect wires across C.P.R. in Horton tp., and near Castleford station, Ont.

8704 to 8709. Nov. 19.—Authorizing C.P.R. to use bridges at mile 47, Central Division, Prince Albert Branch; over Battle River, Western Division, Wetaski-

win section; over Government drainage ditch, Central Division, La Riviere section; bridges 147, 151, 196, 71, 84.3, 99.5, and 132.5, Cranbrook section, Western Division; 104.17 McLeod section, over Old Man River; and bridges 1.5 and 102.9, Western Division Edmonton section.

8710. Nov. 19.—Authorizing C.N.R. to operate temporarily and until further order, spur constructed by G.T.P.R. into Clover Bar Coal Co.'s property at Edmonton, Alta.

8711. Oct. 29.—Ordering that C.P.R. construct highway crossing about one mile west of Carlin station, B.C.

8712, 8713. Nov. 20.—Approving location of G.T.P.R. Calgary branch, mileage 0 to 24.753 and Tofield-Calgary branch, mileage 24.75 to 50, Alta.

8714. Nov. 20.—Authorizing C.P.R. to construct spur across 9th St., North Bay, Ont.

8715. Nov. 15.—Dismissing complaint of J. F. Hunter, Boissevain, Man., against C.P.R. as to the manner in which it handles local freight.

8716. Nov. 15.—Dismissing application of Tees & Perse, Ltd., for order directing C.P.R. to perpetually maintain a siding on what was formerly Point Douglas Ave., Winnipeg.

8718. Oct. 15.—Ordering C.N.R. forthwith to make passenger station facilities adequate and suitable to accommodate 12 persons, at Howell, Sask.

8718. Nov. 15.—Dismissing complaint of McCollom Lumber Co., Winnipeg, that C.P.R. and C.N.R. overcharged on a mixed carload of lumber from Warroad, Minn., to Indian Head, Sask.

8719. Nov. 22.—Authorizing G.T.P.R. to connect with C.N.R. near 1st St. east of 21st St., Edmonton, Alta.

8720. Nov. 23.—Recommending to Governor in council for sanction Temiscouata Ry. by-law re spitting in cars and premises.

8721. Nov. 22.—Authorizing G.T.P.R. to cross C.P.R. at grade at Yorkton, Sask.

8722. Nov. 24.—Authorizing city of Toronto to construct sewer under C.P.R. on Bathurst St.

8723 to 8725. Nov. 23.—Authorizing Bell Telephone Co. to erect wires across G.T.R. at Chesley, Ont., and across P.M.R. at Glenwood station and Leamington, Ont.

8726. Nov. 24.—Authorizing C.N.Q.R. to place tracks and telegraph wires under telephone and power wires of Quebec, Jacques-Cartier Electric Co. and Bell Telephone Co. in St. Sauveur parish.

8727. Nov. 23.—Authorizing Horton & McNab Telephone Co. to erect wires across C.P.R. on lot 9, con. 3, Horton tp., Ont.

8728. Nov. 24.—Authorizing Alberta Government Telephone Company to erect wires across C.N.R., near Bruderheim station.

8729. Nov. 24.—Dismissing application of A. Gordon, Cowichan, B.C., for order directing Esquimalt & Nanaimo Ry. to provide farm crossing where it intersects his farm in Shawinigan district, B.C.

8730. Nov. 23.—Ordering C.P.R. to construct spur at mileage 84.8, from Muskoka on its Toronto-Sudbury branch, Bigwood tp., Ont.

8731. Nov. 23.—Authorizing C.P.R. to construct spur in Beausejour, Man., for J. L. Turner, and Manitoba Glass Mfg. Co.

8732. Nov. 23.—Authorizing G.T.P.R. to construct spur on blocks 13 and 14, river lots 12 and 14, Edmonton, Alta.

8733. Nov. 24.—Authorizing Kaministiquia Power Co. to erect power lines across C.P.R. north of Victoria St., Westfort, Fort William, Ont.

8734. Nov. 24.—Authorizing C.P.R. to construct bridge 19.6 Farnham section, over Richelieu River, Que.

8735. Nov. 23.—Amending order 6523, authorizing G.T.R. to construct overhead

farm crossing bridge at m.p. 125.12, between London and Windsor, Ont., and A. M. Dickie's land.

8736. Nov. 25.—Amending order 6858, Apr. 19, 1909, authorizing Atlantic Quebec & Western Ry. to operate its railway from mileage 19.75 to 20.5 at Port Daniel, Que., by striking out clauses 1 and 2 in the operative part.

8737. Nov. 15.—Extending for 30 days from date of order period within which M.C.R. may widen bed of stream across its right of way under trestle bridge at Bear Creek, near Petrolea, Ont.

8738. Sep. 22.—Amending order of Railway Committee of the Privy Council, Dec. 3, 1892, re crossing of G.T.R. by Davenport St. Ry. at Davenport Rd., Toronto, by ordering Toronto Suburban Ry. to install derrails at crossing interlocked with semaphores and dismissing Toronto Suburban Ry. application for order reducing amount to be paid by it for construction, operation and maintenance of crossing.

8739. Nov. 17.—Restraining Nipissing Power Co. from erecting heat, light and power wires across Bell Telephone Co.'s wires between Powassan and North Bay, Ont.

8740. Nov. 24.—Ordering C.P.R. to lower its tracks where they cross Sutherland Ave., Winnipeg.

8741. Nov. 20.—Dismissing application of settlers of Ribstone, Alta., for order directing G.T.P.R. to provide a spur and loading platform between Dunne and Chauvin, Alta.

8742. Nov. 25.—Extending until Feb. 1, time for installation of interlocking plant at C.P.R. crossing of G.T.R., Drumbo, Ont.

8743. Nov. 22.—Limiting the speed of C.P.R. trains passing over Durham Rd., Walkerton, Ont., to 10 miles an hour.

8744. Nov. 22.—Ordering C.P.R. to provide a shelter with platform at Clark, Ont.

8745. Nov. 25.—Ordering C.N.R. to provide crossing at Lincoln Ave., Rosser municipality, Man.

8746. Nov. 19.—Authorizing C.N.Q.R. to construct its line across highways in Beauport parish, Que.

8747. Nov. 26.—Authorizing G.T.P.R. to appeal to Supreme Court of Canada upon all questions of law arising re location of its line through Fort William, Ont.

8748. Nov. 26.—Rescinding order 7320, June 18, 1909, approving plans of proposed C.N.R. subway at 22nd St., Saskatoon, Sask., by ordering that the city file new plans.

8749 to 8751. Nov. 25.—Authorizing Alberta Government Telephone System to erect wires across C.P.R. at three points.

8752. Nov. 26.—Authorizing Dresden Rural Telephone System to erect wires across P.M.R. at Emmett, Chatham tp., Ont.

8753, 8754. Nov. 26.—Authorizing town of North Battleford, Sask., to lay water and sewer mains under C.N.R. at Victoria St.

8755. Nov. 25.—Authorizing C.N.O.R. to cross and connect with G.T.R. near Brooklyn, Ont.

8756. Nov. 27.—Authorizing Bell Telephone Co. to carry underground wires across Montreal Terminal Ry. at St. Antoine St., Tetraultville, Que.

8757. Nov. 25.—Authorizing C. Lawrence to lay water pipe under C.P.R. Walkerton & Lucknow branch at Durham Rd., Bentinck tp., Ont.

8758. Nov. 27.—Authorizing C.P.R. to construct spur for city of Winnipeg in St. Paul parish.

8759. Nov. 27.—Authorizing C.P.R. to construct spurs for North Pacific Lumber Co., New Westminster district, B.C.

8760. Nov. 29.—Approving C.N.R. location from mileage 0 to 5 up Fraser River from Yale, B.C.

8761. Nov. 29.—Authorizing C.P.R. to divert road allowance between secs 22 and 15, tp. 8, r. 5, Man.

The Hamilton Steel & Iron Co.

HAMILTON, CANADA

LIMITED

PIG IRON

RR. AXLES
TRACK SPIKES

ANGLE BARS
TIE PLATES

Marine and Railroad

FORGINGS

In Rough, Rough Turned or Smooth Finished

BAR IRON

BAR STEEL

Plain, Cold Twisted or Deformed

STEEL BARS

For

CONCRETE REINFORCEMENT

THE ELECTRIC HEADLIGHT

The following letter was received under date of May 8, 1908, from Mr. J. W. Cleary, Travelling Engineer Pyle-National Electric Headlight Co.:

"I learn from _____ the Master Mechanic here, that an engineer running between _____ and _____ discovered a broken rail with the Pyle-National Electric Headlight and made the stop without ditching his train. One or two pairs of wheels got off, but that was a small affair to what it would have been where a foot of the rail was broken off. Also an engineer running east of here found some cars shoved out on the main line. He saw them with the 'Electric' and made the stop without hitting them."

PYLE-NATIONAL ELECTRIC HEADLIGHT CO.
MONADNOCK, CHICAGO

8762. Nov. 29.—Approving V.V. & E.R. location from Hope station 1988-79 to station 3020-7.5, to the boundary between Yale and Westminster districts, B.C.

8763. Nov. 29.—Approving C.N.O.R. location from Rideau River, mileage 5.3 to boundary between Goulbourne and Nepean tps.

8764, 8765. Nov. 29.—Authorizing Vancouver Power Co. to cross the Y of the C.P.R. Seattle branch north of Huntingdon station, and the main line and spur at Clayburn station, B.C.

8766. Nov. 29.—Authorizing C.P.R. to construct siding to R. West & Co.'s premises at mileage 14.75, London section, Ont.

8767. Nov. 29.—Extending for 30 days from date of order, time within which M.C.R. and P.M.R. shall each install upon its own line a highway crossing on town line between Southwold and Dunwich tps., Ont.

8768. Nov. 26.—Ordering C.P.R. to provide highway over its line at Mackey station, Head tp., Nipissing district, Ont.

8769. Dec. 2.—Authorizing Canada Atlantic Ry. (G.T.R.) to construct siding from south side of Sappers Bridge to the Chateau Laurier site, Majors Hill Park, Ottawa.

8770. Nov. 29.—Amending order 8540, Oct. 15, 1909, by approving substituted plans and specifications of Colchester North tp., Ont., re drain under M.C.R.

8771. Nov. 29.—Authorizing town of St. Louis, Que., to lay water pipe under C.P.R. at Sanguinet St.

8772. Dec. 2.—Authorizing Chatham Gas Co. to lay main under G.T.R. at Degge St. crossing, Chatham, Ont.

8773. Nov. 30.—Authorizing Burlington village, Ont., to place wires under G.T.R. at Burlington Beach, Ont.

8774 to 8777. Nov. 22.—Authorizing Consolidated Telephone Co. to erect wires across C.P.R., near Upper Kent station, one mile south of Bath, at Bath, and at Bristol, N.B.

8778, 8779. Nov. 22.—Authorizing Brussels village, Ont., to erect wires across C.P.R. at Walton and across G.T.R. at intersection of line between cons. 4 and 5, Morris tp., Ont.

8780. Nov. 22.—Authorizing North Huron Telephone Co., Wingham, Ont., to erect wires across G.T.R. near Whitechurch station, Ont.

8781. Dec. 1.—Authorizing Claremont & Ashburn Telephone Co. to erect wires across G.T.R. at 7th con. Whitby tp., Ont.

8782 to 8784. Nov. 18, 30.—Authorizing Bell Telephone Co. to erect wires across C.N.Q.R. at Tetraultville, Que., and across C.P.R. near Shaw station, Ont., and near St. Cuthbert station, Que.

8785 to 8793. Nov. 22.—Authorizing Manitoba Government Telephones to erect wires across C.P.R. at three points; C.N.R. at five points; and G.T.P.R. at one point.

8794 to 8798. Dec. 1.—Authorizing Alberta Government Telephones to erect wires across G.T.P.R. at two points; C.P.R. at two points and C.N.R. at one point.

8799. Dec. 1.—Authorizing Saskatchewan Government Telephones to erect wires across C.N.R. at Hague.

8800. Nov. 30.—Ordering C.P.R. to reconstruct culvert under tracks at mileage 3.3, Sudbury section, Humphrey tp., Ont.

8801. Dec. 1.—Amending order 7746, Aug. 5, 1909, approving C.N.R. location from tp. 15, r. 17, w. 6th m. to sec. 11, tp. 14, r. 17, w. 6th m., mileage 0 to 5, B.C., by changing the reference to r. 17, to read "r. 27."

8802. Nov. 29.—Authorizing C.P.R. to open for traffic the portion of its second track from mileage 59.4 to 59.6, Fort William section, Ont.

8803. Nov. 18.—Authorizing C.N.Q.R. to construct spur from near St. Marc's Jct. through St. Marc, Grondines and St. Albans parishes.

8804. Dec. 1.—Approving stress sheets

of C.N.R. Lac Ouareau-Rawdon extension.

8805. Dec. 1.—Authorizing C.N.O.R. to construct its line across six highways in Whitechurch tp., York county.

8806. Nov. 30.—Extending until June 1, 1910, time within which North American Telegraph Co. may file tariffs of tolls.

8807. Nov. 30.—Extending until June 1, 1910, time within which North American Telegraph Co. may file tariffs of tolls.

8808. Nov. 30.—Certifying amended plan of C.N.R. right of way as constructed across s.e. $\frac{1}{4}$ sec. 24, tp. 43, r. 4, w. 3rd, m. north 28 miles from Dalemy, Sask.

8809, 8810. Nov. 27.—Dismissing application of city of Edmonton, Alta., for orders varying orders 5598, Nov. 12, 1908, and 6751, Feb. 19, 1909, providing that the G.T.P.R. and C.N.R. each provide its own diamond crossing, and that gates with home signals, to be operated by a watchman, be substituted for the half-interlocking plant required to be installed, and authorizing the city to again apply for the establishment of gates or other protection.

8811. Nov. 30.—Authorizing G.T.R. to construct siding to Otis-Fensom Elevator Co.'s premises, Hamilton, Ont.

8812. Nov. 30.—Authorizing C.P.R. to construct siding to the Noxon Co.'s premises, Ingersoll, Ont.

8813. Nov. 30.—Ordering G.T.P.R. to construct highway crossing and road diversion between secs. 25 and 26, tp. 35, r. 12, w. 3rd m., Saskatoon district, Sask., in accordance with and subject to general regulation of Board affecting highway crossings.

8814. Nov. 29.—Authorizing C.P.R. to construct spur in lots 15 and 16, r. 7, Aylwin tp., Que.

8815. Nov. 30.—Dismissing application of Tilbury East and Raleigh tps., Ont., for construction of bridge over Jeanette's and Baptiste Creeks, by G.T.R. on its Southern division.

8816. Dec. 3.—Authorizing C.N.O.R. to open for traffic the portion of its Ottawa-Hawkesbury division, from Rockland to Hurdman's bridge, Ottawa.

8817. Dec. 3.—Approving C.N.O.R. by-law authorizing D. B. Hanna, Guy Tombs and W. H. Jordan, to prepare and issue tariffs of tolls to be charged between and including Hawkesbury and Ottawa.

8818. Dec. 3.—Approving Standard Passenger Tariff C.R.C. 153, providing for maximum passenger rate of 3c. a mile between all stations on C.N.Q.R. and C.N.O.R., Ottawa section.

8819. Dec. 3.—Extending until June 1, 1910, time within which Canadian and Dominion Express Companies' tariffs of tolls for carriage of goods are temporarily approved.

8820. Dec. 2.—Dismissing complaint of Wagstaff, Ltd., Hamilton, Ont., that rate of \$1.20 per 100 lbs. charged by the Dominion Ex. Co. on black currants from Montreal to Hamilton is excessive and discriminative as compared with rate of 80c. per 100 lbs. charged on like shipments from Hamilton to Montreal.

8821. Dec. 3.—Extending until June 1, 1910, time within which National and American Express Companies' tariffs of tolls for carriage of goods are temporarily approved.

8822. Dec. 3.—Extending until June 1, 1910, time within which Maritime Express Co. may file tariffs of tolls for carriage of goods.

8823. Dec. 4.—Authorizing C.P.R. to open for traffic the second track of its Smith's Falls section from Vaudreuil to St. Lazare, also from mileage 44.9, just west of Dalhousie Mills to mileage 48.6; and from mileage 48.8 to Avonmore.

8824. Dec. 3.—Extending until June 1, 1910, time within which the United States and the Great Northern Express Companies may file tariffs of tolls for carriage of goods.

8825 and 8826. Dec. 2.—Authorizing

city of Hamilton, Ont., to lay sewer under Hamilton Radial Electric Ry. and Toronto, Hamilton & Buffalo Ry. in Barton tsp., Ont.

8827. Dec. 6.—Authorizing G.T.P.R. to cross, at grade, the C.P.R. Pheasant Hills branch in sec. 13, tp. 21, r. 12, west of 2nd mer., Balcarres, Sask.

8828. Dec. 4.—Authorizing C.P.R. to construct spur to Continental Oil Co. and Canadian Petrified Brick & Stone Co.'s premises, Winnipeg.

8829. Dec. 6.—Authorizing city of Hamilton, Ont., to lay sewer under G.T.R. in Barton tsp., Ont.

8830. Dec. 4.—Authorizing Manitoba Government Telephones to erect wires across C.N.R. near Bethany.

8831, 8832. Dec. 4.—Authorizing North Huron Telephone Co. to erect wires across G.T.R. at two points near Wingham station, Ont.

8833 to 8837. Dec. 4.—Authorizing Guelph, Ont., Board of Light and Heat Commissioners to erect wires across C.P.R. at three points and G.T.R. at two points.

8838. Dec. 7.—Authorizing Temiscouata Ry. and Transcontinental Ry. to operate trains where the Temiscouata Ry. crosses Transcontinental Ry., about 12.2 miles west from Edmundston, N.B.

8839. Nov. 16.—Authorizing town of St. Louis, Que., to carry its highway under C.P.R. at St. Lawrence Blvd.

8840. Dec. 4.—Authorizing Bell Telephone Co. to place wires under Hamilton Radial Electric Ry. about two miles east of Burlington, Ont.

8841. Dec. 4.—Authorizing C.P.R. to construct spur for Rirdon Paper Mills, Ltd., at mileage 95.16 from Ste. Therese, Que.

8842. Dec. 4.—Authorizing Toronto, Hamilton & Buffalo Ry. to construct spurs in n.e. part of Hamilton, Ont.

8843. Dec. 4.—Authorizing C.P.R. to construct spur in Lethbridge, Alta.

8844, 8845. Dec. 7.—Authorizing Bell Telephone Co. to erect wires across G.T.R. near Callander station, and near New Toronto, Ont.

8846. Dec. 7.—Authorizing Port Hope Telephone Co. to erect wires across G.T.R. at Newcastle, Ont.

8847. Dec. 6.—Ordering that Toronto Suburban Ry. install and maintain derrails at crossing with G.T.R. at Davenport Road, Toronto.

8848. Dec. 7.—Authorizing Quebec Ry. Light & Power Co. to cross with its tracks the C.P.R. tracks at St. Valier St., Quebec.

8849. Dec. 7.—Approving location of C.P.R. station at Grassy Lake, Alta.

8850. Dec. 2.—Ordering G.T.R. to install distant semaphore at crossing with Galt, Preston & Hespeler Ry. at Hespeler, Ont.

8851. Nov. 24.—Authorizing city of Saskatoon, Sask., to carry Saskatchewan Drive under C.N.R. bridge.

8852. Dec. 7.—Approving stress sheets of G.T.R. for proposed renewal of viaducts near Tansley and Stewerton, Ont.

8853. Dec. 7.—Authorizing Erle Telephone Co. to place wires across G.T.R. two miles west of Canfield, Ont.

8854. Dec. 7.—Authorizing city of Toronto to lay sewer under C.P.R. on Huron St.

8855. Dec. 7.—Authorizing Bell Telephone Co. to place wires across G.T.R. telegraph lines two miles east of Burlington Jct., Ont.

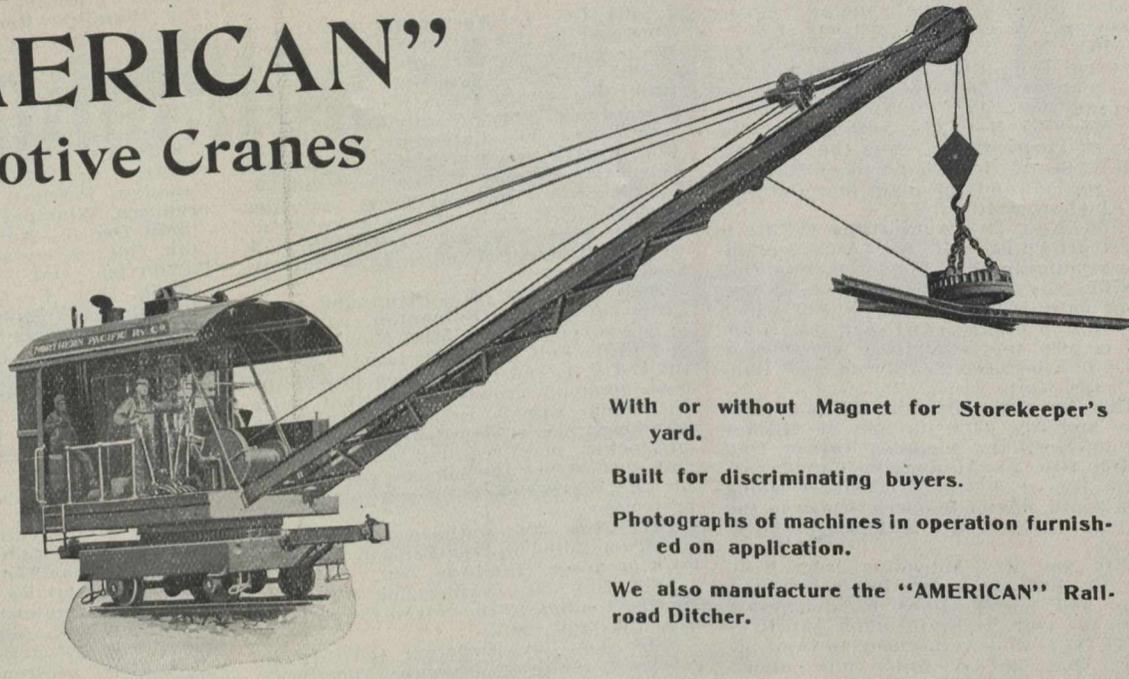
8856. Dec. 6.—Authorizing G.T.R. to construct bridge over Ham's Creek, near Ernestown, Ont.

8857. Dec. 3.—Ordering C.P.R. to provide highway crossing at Murray St., Sault Ste. Marie, Ont.

8858, 8859. Dec. 10.—Authorizing Ontario Power Co. of Niagara Falls, Ont., to erect wires across the G.T.R. in Thorold tp., Ont.

8860. Dec. 10.—Directing that all railways, where shippers are compelled to

"AMERICAN" Locomotive Cranes



With or without Magnet for Storekeeper's yard.

Built for discriminating buyers.

Photographs of machines in operation furnished on application.

We also manufacture the "AMERICAN" Railroad Ditcher.

AMERICAN HOIST & DERRICK CO.

ST. PAUL, U.S.A.

CHICAGO

NEW YORK

PITTSBURG

NEW ORLEANS

IF WE CAN'T SHOW YOU

ECONOMY IN OUR PUMPS — WE DON'T ASK FOR YOUR BUSINESS

Put it "up to us." It will cost you nothing. Tell us the service you require of it and we will recommend a

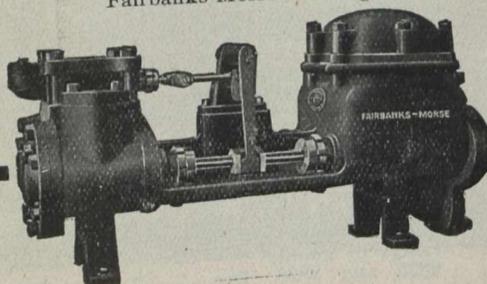
FAIRBANKS-MORSE PUMP

Pump especially adapted for that service. Profit by our eighteen years' experience in the manufacture of Steam and Power Pumps. We have both quality and price.

THE CANADIAN FAIRBANKS CO., LIMITED

Fairbanks Standard Scales
Fairbanks-Morse Gas Engines

Montreal
Toronto
St. John, N.B.



Winnipeg
Calgary
Vancouver

supply car doors to enable cars to be used for traffic, make allowance therefor to such shippers upon the following basis:—at and west of Fort William, lower car door, \$1; upper car door, 50c.; east of Fort William, upper or lower car door, each 50c.

8861. Dec. 2.—Authorizing C.N.O.R. to carry its proposed railway under G.T.R. near Scarboro Jct., Ont.

8862. Dec. 9.—Approving proposed bridge of Atlantic, Quebec & Western Ry. over Grand Pabos gully, at mileages 41 and 40.8.

8863. Dec. 9.—Authorizing C.P.R. to construct spur for Western Canada Timber Co., mileage 29.5 north from Lardo, B.C.

8864. Dec. 9.—Authorizing C.P.R. to construct spur at Gerrard station, B.C.

8865. Dec. 10.—Approving location of C.P.R. revision on a portion of its Kininvie branch.

8866. Dec. 10.—Approving location of C.N.O.R. at Greenwood, Pickering tp., Ont.

8867. Dec. 10.—Ordering that P.M. Rd. erect fences along its railway where it crosses near Cedar Springs, Raleigh tp., Ont.

8868. Dec. 10.—Authorizing G.T.P.R. to construct its railway across highways between secs. 35 and 34, and 34 and 33, tp. 52, r. 27, w. 4th m., North Alberta.

8869 to 8875. Dec. 10.—Authorizing Manitoba Government Telephones to erect wires across C.P.R. at seven points.

8876, 8877. Dec. 10.—Authorizing Bell Telephone Co. to erect wires across G.T.R. at West and Market Sts., Brantford, and near Whitby, Ont.

8878. Dec. 11.—Approving C.N.R. location through tp. 5, r. 7-11, west of 2nd mer., Sask.

8879. Dec. 10.—Ordering that C.P.R. and P.M.R. may operate trains over interlocker installed at Walkerville Jct. Ont.

8880. Dec. 10.—Authorizing C.P.R. to construct spur for Andrews & Son, Winnipeg.

8881. Dec. 10.—Authorizing C.N.O.R. to construct bridge over Rouge River, Scarboro tp., Ont.

8882. Dec. 10.—Authorizing C.P.R. to construct branch line near Westminster Jct., B.C.

8883. Dec. 9.—Authorizing C.P.R. to construct spur at mileage 86 from Lethbridge, Crow's Nest branch.

8884. Dec. 11.—Authorizing Dominion Natural Gas Co. to lay main under G.T.R. at Maple St., Simcoe, Ont.

8885. Dec. 11.—Authorizing Dr. A. L. Russell to erect telephone wires across G.T.R. at Fraserville, Ont.

8886, 8887. Dec. 11.—Authorizing Alberta Government Telephones to erect wires across C.P.R. at Camrose and Sedgewick.

8888. Dec. 11.—Authorizing Bell Telephone Co. to erect wires across G.T.R. 2½ miles south of Harriston, Ont.

8889. Dec. 13.—Authorizing C.N.R. to cross with its Goose Lake branch the G.T.P.R. near Saskatoon, Sask.

8890. Dec. 13.—Authorizing C.N.R. to cross with its track the C.P.R. near Bienfait, Sask.

8891. Nov. 22.—Authorizing Ontario Power Co. to cross with its transmission line the M.C.R. in Stamford tp., Ont.

8892, 8893. Dec. 11.—Authorizing C.N.O.R. to construct bridge over Dixie and Greenwood creeks, Pickering tp., Ont.

8894. Dec. 11.—Authorizing C.N.Q.R. to construct its line across lot 408, St. Marc parish, Portneuf Co., Que.

8895. Dec. 11.—Authorizing Canada Atlantic Ry. to reconstruct bridge across River St. Lawrence, between Giroux Island and Isle aux Seines.

8896. Oct. 17.—Approving C.P.R. crossings at Blackstone Rd., Moor's Rd., Gough's Rd., mileages 118.09, 119.67 and

120.25, and Portage Bay Rd., mileage 123.21.

8897. Dec. 11.—Amending order 2139, Dec. 6, 1906, which approved form, size and style of tariffs of telephone tolls.

8898. Dec. 13.—Authorizing C.P.R. to divert Hamilton St., Regina, Sask.

8899. Dec. 14.—Authorizing C.N.O.R. to construct bridge in Whitby tp., Ont.

8900. Dec. 13.—Approving plan of subway at intersection of Albert St., Regina, Sask.

8901. Dec. 14.—Authorizing city of Brantford, Ont., to lay sewer under G.T.R. across West St.

Turbo-Electric Locomotive.

Hugh Reid recently addressed the Glasgow University Engineering Society on the Reid-Ramsay turbo-electric locomotive now being built in Glasgow, Scotland. In describing it he said that steam is generated in a locomotive boiler, which has a superheater, and the coal and water supplies are carried in the side bunkers and side water tanks at both sides of the boiler. The steam is led to a 3,000-r.p.m. impulse turbine, to which is directly coupled a d.c. generator. The dynamo supplies current at from 200 to 600 volts to four series-wound traction motors, the armatures of which are built on the four driving axles of the locomotive. The exhaust steam from the turbine passes into an ejector condenser, and is, together with the circulating condensing water, delivered eventually to the hot well. As the steam turbine, unlike the reciprocating steam engine, requires no internal lubrication, the water of condensation is free from oil, and consequently is returned from the hot well direct to the boiler by a feed pump. This condensing water is circulated by centrifugal pumps driven by auxiliary steam turbines placed alongside the main turbine and dynamo. The cycle of the condensing water is from tanks through the first pump, then through the condenser, where it becomes heated in condensing the exhaust steam, then to the hot well. From the hot well it passes through the second pump to the cooler, situated in front of the locomotive, where the full benefit of the blast of air caused by the movement of the locomotive, aided by a fan, is utilized for cooling the hot circulating water.

The condensation of the exhaust steam deprives the locomotive boiler of the usual exhaust blast which induces the draft through the firebox and boiler tubes. In the experimental locomotive the induced draft is replaced by forced draft provided by a small turbine-driven fan. The fan is placed within the cooler, so that it will deliver hot air to the boiler fire, and at the same time assist the current of air through the cooler. The small switchboard and the instruments required, and the controller for the four motors are all placed on the motorman's platform within easy reach.

The main and auxiliary machinery of this experimental locomotive is mounted upon a strong underframe, which is carried upon two trucks, each of which carries two motors. As the locomotive is intended for express passenger main line work, it is hoped to obtain comparisons from its actual working with the performances of the reciprocating steam locomotives, especially as regards the relative consumption of fuel and water, the efficiency of transforming the energy of steam into drawbar pull, and also the relative rapidity of acceleration under the old and new systems.

The American Railway Master Mechanics' Association and the American Railway Master Car Builders' Association annual conventions will be held at Atlantic City, N.J., June 15 to 18 and June 20 to 22, respectively.

Great Northern Railway.

In connection with the various lines in Canada, owned by the G.N.R., the following information as to work done during 1909, and the work in progress will be of interest:—In Minnesota, the company has laid about 20 miles of track from Nashawauk to Grand Rapids. The extension is not yet completed. Nashawauk is on the Duluth, Swan River and Virginia line, and Grand Rapids is on the main line from Duluth westerly. In Washington State it has laid 60.62 miles of tracks from Columbia River to Westfield; a line projected to connect up in course of time with the company's line either at Marcus or Republic, and so give a through connection with its existing lines in the Kettle and Kootenay valleys in British Columbia. Another piece of line completed is the reconstruction from Blaine to the International boundary, 2.96 miles. This line connects with the Vancouver, Victoria and Eastern Ry., at the boundary and runs into Vancouver, replacing the old New Westminster Southern Ry., which has been abandoned. The lines under construction or projected are:—in North Dakota, from Stanley to Powers Lake, 24 miles; this branch runs north-westerly, towards the International boundary. In Montana a line is projected for 52 miles from Bainsville, to Plentywood, also just south of the International boundary. In Washington State a line is under construction from Oroville, on the section of the Vancouver, Victoria and Eastern Ry., which runs south of the International boundary, to Pateros, 76 miles. This line will ultimately connect with the main line at Wenatchee. In connection with the Spokane, Portland and Seattle Rd., the company is also constructing two miles of line at Spokane.

Midland Ry. of Manitoba.—We are advised that no recent purchases of land have been made for terminal purposes in Winnipeg by the M. Ry. of M., or any of the other companies connected with it; neither is any further purchase contemplated. Practically all the property required was purchased some time ago. It is not likely that any construction will be proceeded with during the winter.

Vancouver, Victoria and Eastern Ry. and Navigation Co.—The laying of track into Princeton, B.C., is reported completed, the mileage laid during the year, from Keremeos, being estimated by A. H. Hogeland, Chief Engineer, St. Paul, Minn., at 42 miles; and by J. H. Kennedy, Chief Engineer on the work at about 45 miles. The estimates were made on different dates, and at neither time was the work completed. The company also completed and put in operation 21.05 miles of new line from the International boundary, north of Blaine, Wash., to New Westminster, replacing the old New Westminster Southern Ry.; the track laying for this line was completed in 1909. It also completed the portion of the line from Cloverdale to Sumas, B.C., 29.29 miles; 27.29 miles of track had been laid on this line up to Dec. 31, 1908, so that only two miles had to be laid to complete it. The company has also laid 1.93 miles in Vancouver, called its Burrard Inlet line.

The section of the line between Keremeos and Princeton was taken over by the operating department, Dec. 8, and a permanent train service was put on Dec. 11. The company is purchasing a right of way for the extension of the line from Princeton and Abbotsford in the Fraser River Valley, west of the Hope Mountains. (Dec., 1909, pg. 887).

The bill brought by E. A. Lancaster before the House of Commons to amend Sec. 238a of the Railway Act was on Nov. 25 ordered to be "read a second time this day six months."

NOVA SCOTIA STEEL AND COAL CO.

MANUFACTURERS OF

LIMITED

Railway and Electric Car Axles, Angle Bars and Tie Plates, Railway Spikes

Tee Rails 12, 18, and 28 lb. per yard

ALL SIZES BAR STEEL FOR CAR-BUILDERS' USE. Spring, Machinery, Tire, Angles, and Merchant Bar Steel. Heavy Forgings of all Descriptions.

SCOTIA PIG IRON Also Miners and Shippers of the Famous Old Mines "SYDNEY" **COAL**

High in Carbon—Low in Ash. The best Steam Coal for Locomotive, Steamship, and Stationary Boilers.

Works at

NEW GLASGOW AND SYDNEY MINES, NOVA SCOTIA.

Collieries at
SYDNEY MINES

FOR PRICES AND OTHER PARTICULARS APPLY TO

Head Office : NEW GLASGOW, N. S.

POLSON IRON WORKS

LIMITED

TORONTO, CANADA

Steel Shipbuilders, Engineers == and Boilermakers ==

Hydraulic and Dipper Dredges, Steel and Composite Steamers and Yachts, Marine and Stationary Engines and Boilers.

Agents for Quebec: Watson Jack & Co., 709 Power Building, Montreal

— OFFICE AND WORKS —

ESPLANADE STREET EAST, TORONTO

National Transcontinental Railway.

We are advised that it is estimated that 312 miles of track were laid during 1909 on the Eastern Division, and on various stretches between Moncton, N.B. and Winnipeg, making with the 249 miles laid to Dec. 31, 1908, a total of 561 miles, and leaving 1,244 miles to be laid to complete the division. The track laid during 1909 is distributed over the different contracts as follows:—Moncton westerly mileage 20 to 30, and mileage 53 to 56, 13 miles; Chipman, mileage 5 to 10 west, five miles; crossing of the Intercolonial Ry., 36 miles west from Moncton, to 13 miles easterly and to 14 miles westerly, 27 miles; from Quebec-New Brunswick boundary easterly for 27 miles, and from mileage 61 to 64, three miles, making 30 miles; east of Quebec bridge 16 miles have been laid between mileage 2.6 and 36; west of the same point 10 miles have been laid in the first 50 miles, 15 miles between the 50th and to the 158th mile; at the junction with the Temiskaming and Northern Ontario Ry. nine miles of track have been laid easterly and 35 miles westerly; from mileage 8 east of the Ontario-Manitoba boundary to mileage 152 east, 144 miles.

Replying to questions in the House of Commons, Nov. 25, the Minister of Railways stated in regard to the delay in the completion of work by several of the contractors, that the contracts provided for a forfeit of \$5,000 for each calendar month of default; that no extensions of any of the contracts had been given, and that the enforcement of the penalty clause was a matter for consideration before final payments were made.

On Dec. 9, the Minister said, the only amount paid for terminals for the Railway was \$2,187.50 a month paid to the Canadian Northern Ry., being the Government's proportion of rental for terminals at Winnipeg, under the agreement of Mar. 1, 1907. No estimate had been made of the total cost of the terminals required for the line.

Quebec Bridge.—Preliminary work was started on the reconstruction of the bridge over the St. Lawrence at Quebec, Dec. 8, when about 100 men were put to work around the approaches of the old bridge, for the purpose of preparing for the clearing away of the debris, and the demolishing of such parts of the old work as have been condemned, preparatory to the construction of new piers and other works. A contract will be let at an early date for the removal of the steel work between the land and the piers. This has to be done by the spring so as to allow the caissons for the new piers to be sunk by May 1.

The Minister of Railways, in reply to questions in the House of Commons recently, stated that the new bridge is to be erected at the same site as the old one, the south pier will be used in part but must be enlarged, a new pier will be sunk to the rock on the north side, and the other piers will be rebuilt. Further questions elicited the information that the existing south pier caisson will be fully used, and enlarged to carry the greater load that will be required for the new superstructure. At the north pier, borings have demonstrated that the caisson can be founded on the rock and the span reduced from 1,800 ft. to 1,758 ft. The existing north pier will be demolished. The old bridge was estimated to weigh 35,000 tons, and was to have been built of carbon steel. The new bridge will be built in part of carbon steel, using nickel steel in the more important members. The weight cannot be given at present pending the receipt of tenders for the superstructure.

On Dec. 9, the Minister stated that the total cost of the Quebec bridge to date was \$6,905,852.35; including subsidies paid of \$374,353.33. A contract had been let to

M. P. Davis for the substructure of two pneumatic caissons, two abutments, two anchor piers and one intermediate pier, which will all be required if the ultimate decision is for a cantilever bridge, at a cost of \$2,448,475. If the decision is that a suspension bridge is to be built the abutment, centre pier and anchor pier will not be required; but anchorage piers for the cables will be required. No estimate for the latter had been made. There was a provision in the contract for withdrawing the items named. The cost of the two pneumatic caissons would be \$2,000,800, and these will be required as planned whatever type of bridge superstructure is ultimately decided upon. Pending such decision it was not in the public interest to give any estimates of the cost of the superstructure.

The Department has issued an invitation to contractors for bridge superstructures to visit the office of the Board of Engineers in Montreal, after Jan. 3, for the purpose of receiving information to enable them to prepare bids for the superstructure of a span of 1,758 ft., having a width of 88 ft.

GRAND TRUNK PACIFIC RY.

We are advised that during 1909 the company laid 309 miles of new track distributed as follows:—from Irma, Alta., to Cloverbar, Alta., 102 miles; from Edmonton to Wolfe Creek, Alta., 122 miles, making 224 miles of main line; branch line from Melville to Balcarres, Sask., 34 miles; branch from Melville to Yorkton, Sask., 25 miles; and branch line from Tofield to Camrose, Alta., 26 miles, making a total of 85 miles of branch lines. The company has under construction 414 miles of main line and 24 miles of a branch. The contract for the main line work is being carried out under several contracts by Foley, Welch and Stewart, with headquarters at Stoney Plain, Alta., and Prince Rupert, B.C. The eastern contracts cover the 179 miles from Wolfe Creek to Tete Jaune Cache, and the western contracts cover the 235 miles from Prince Rupert to Aldermere, B.C. The branch line under contract is an extension of the Tofield-Camrose branch 24 miles southerly, the contract being let to J. D. McArthur, Winnipeg.

Replying to questions in the House of Commons recently the Minister of Railways said the cost of the Prairie section of the line, from Winnipeg to Wolfe Creek, 915 miles, to Sept. 15 had been at the rate of \$33,423 a mile, and it was estimated it would cost \$1,557 a mile more to complete it. On the Mountain section, from Wolfe Creek to Prince Rupert, there had been expended to Sept. 30, \$7,053,863, and it was estimated that it would require \$60,002,136.89 more to finish it; this amount includes \$5,536,000 for interest. In reply to another question he said the Government was not paying any sum for terminals on the G.T. Pacific Ry.; it merely guaranteed the company's bonds for \$13,000 a mile on the Prairie section, and to the extent of 75% of the cost of the Mountain Section.

The company has under construction an 18-stall standard round house at Edmonton, Alta. The foundations will be of concrete, the walls of brick, the frame work of timber with cast iron door columns, the roof of steel trusses in the machine shop, and the roof covering of tar and gravel. The building will be heated with hot air piping carried underground.

In a recent interview at New York, C. M. Hays, President G.T.R., stated that of the line easterly from Prince Rupert about 110 miles had been completed. The whole line was expected to be completed within three years.

Reports from Prince Rupert state that work on the second section of the line easterly has been suspended owing to the lack of supplies, principally explosives for blasting. Navigation closed at a much earlier date than was antici-

pated, consequently the contractors were not able to get their supplies in by steamer. An attempt will be made to get in supplies for some of the camps by land, but it is not expected that it will be possible to keep more than two or three camps going.

The Dominion Parliament is being asked to pass an act authorizing the construction of the following additional lines by the G.T. Pacific Branch Lines Co.:—From between the east limit of range 12 and the west limit of range 17 west of the third meridian, thence south-westerly and westerly to Calgary, Alta., or to the line authorized to be constructed by par. 14, clause 11, chap. 99, of the statutes of 1909; from the last mentioned line between the east limit of range 20 and the west limit of range 28 west third meridian, easterly or south-easterly to Regina, Sask.; from the last mentioned line between east limit of range 24, and west limit of range 27, west of the second meridian to Moose Jaw, Sask.; from between Artland and Wainwright, easterly and south-easterly to the line authorized to be constructed to Battleford, by par. 13, clause 11, chap. 99, of the statutes of 1909; from Regina, south-westerly and westerly to Lethbridge, Alta., on the line authorized to be constructed from Calgary to the southern boundary of Alberta, near Coutts; from the main line between Moose Lake and Tete Jaune Cache, through the valley of the Clearwater River, Bonaparte River, Seaton and Anderson lakes, Lillooet or Squamish River, to Vancouver, B.C. The company also asks power to issue bonds for \$30,000 a mile for the Manitoba, Saskatchewan and Alberta extensions, and for \$50,000 a mile for the extension to Vancouver. (Dec., 1909, pg. 893).

Union Station at Fort William.

The plans for the new union station to be erected at Fort William, Ont., by the C.P.R., for the joint use of the C.P.R. and the G.T. Pacific Ry., show a building 272 ft. long. The central portion will have a frontage of 105 ft., a depth of 51 ft. and a height of three stories, and basement. This three story building will be about 46 ft. high and the plan shows an attractive and imposing frontage, the principal feature in which is the arched doorway. The one story building to the right will have a frontage of 104 ft. and a depth of 34 ft., and that on the left a frontage of 63 ft. and a depth of 34 ft. The track frontage while not quite so imposing as the road frontage is equally attractive. Projecting over the platform along the main building will be a glass awning carried on steel trusses. The building will be erected on concrete and stone foundations; the superstructure of brick with stone, copings, keystones, and other finishing. Entering from the street there is a large vestibule, leading by swinging doors into a general waiting room, 102 by 34 ft., off which, to the right are the women's waiting, retiring and toilet rooms; and to the left, are men's waiting room and lavatories. To the right, at the track front is the joint ticket office, while adjoining the women's waiting room is the telegraph office. At the left hand, towards the track front are offices for the station master, parcels office, and the stairway to the upper stories, in which will be the offices for the divisional staffs. The baggage annex, 104 by 34 ft., contains a general baggage room with closed off sections for baggage checkers, storage of valises, the general public, and the baggage masters office. The annex at the other end of the building has a frontage of 63 by 34 ft., and is to be divided between the Dominion and Canadian Express Co.'s.

N. CURRY, President
N. A. RHODES, Vice-President

CAPITAL \$1,000,000

J. M. CURRY, Sec.-Treas

RHODES, CURRY COMPANY, LIMITED

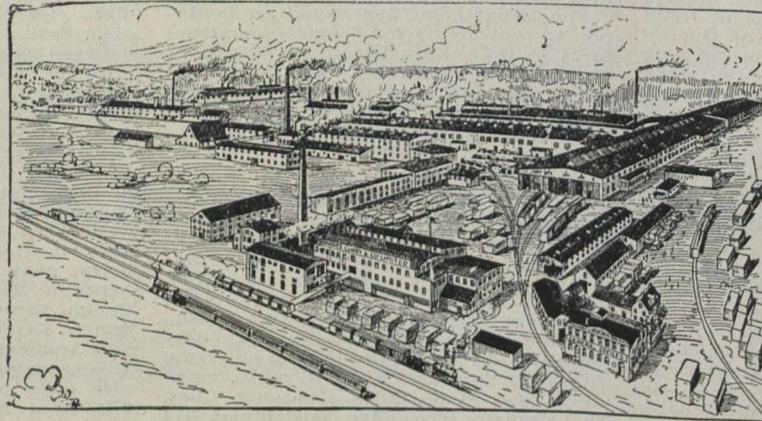
AMHERST, NOVA SCOTIA

RAILWAY AND STREET CARS

SPECIAL CARS FOR ALL PURPOSES

Capacity per Month

- 300 Freight Cars
- 4 Passenger Cars
- 4 Snow Plows
- 3,000 Car Wheels



Capacity per Month

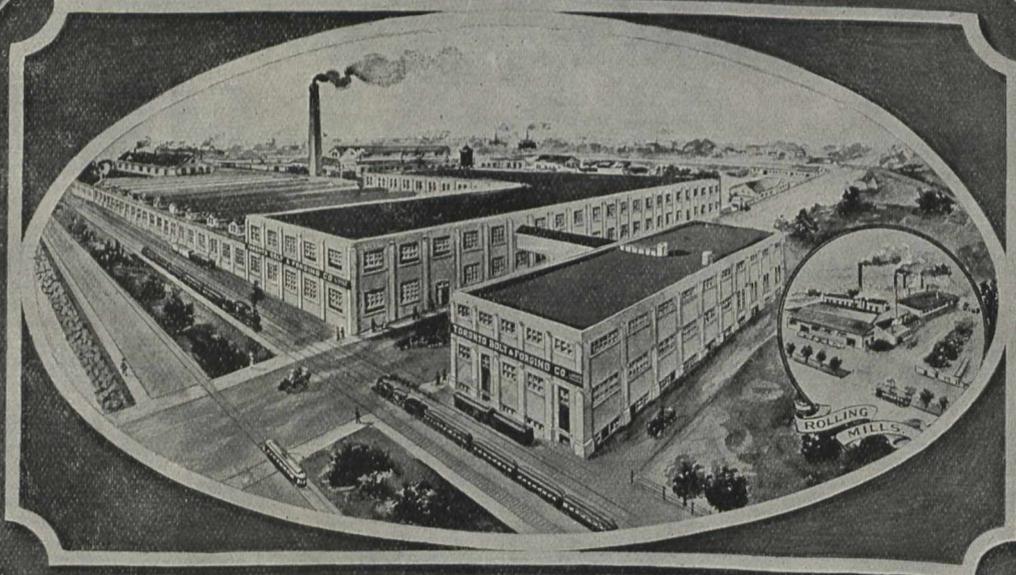
- 2,500 Car Axles
- 500 Tons Castings
- 1,000 Tons Forgings
- 1,000 Tons Bar Iron and Steel

Car Wheels, Axles, Forgings, Castings, Bar Iron & Steel, Etc.

MAKERS OF BOLTS OF ALL KINDS

NUTS

RIVETS



TORONTO BOLT AND FORGING Co. LIMITED
TORONTO, CANADA.

MAINLY ABOUT PEOPLE.

Mrs. Hayter Reed, wife of the Manager in Chief, C.P.R. Hotels, is staying in California.

J. McVicar, a railway contractor of Goderich, Ont., died at Toronto, recently, aged 69.

A. R. Creelman, K.C., General Counsel C.P.R., and his daughters have gone to Bermuda.

C. R. Hosmer, director C.P.R., accompanied by Mrs. and Miss Hosmer, is spending the winter in Italy.

A. C. Smith, C.P.R. Ticket Agent, Winnipeg, has resigned to enter the Western Rubber & Supply Co.'s service there.

George Ham, of the C.P.R. headquarters staff, Montreal, is confined to his house by illness.

Sir Alfred L. Jones, head of the Elder-Dempster Co., Liverpool, Eng., died there, Dec. 13, aged 64.

Miss Margaret Haney, daughter of M. J. Haney, contractor, Toronto, is to be married there, Jan. 6, to Dr. A. H. Spohn.

H. Grout, C.E., who was for 30 years in the old Great Western Ry.'s service, died at St. Catharines, Ont., recently, aged 78.

F. Barlow Cumberland, Vice President Niagara Navigation Co., has published a third edition of his History of the Union Jack.

A. B. Calder, General Agent, Passenger Department C.P.R., Seattle, Wash., has returned there after a holiday trip to Europe.

John Mason, who died in Stratford, Ont., recently, was father of T. J. Mason, of the Northern Pacific Ry. engineering staff at Tacoma, Wash.

C. R. Hosmer, director C.P.R., will erect an additional pavilion to the Alexandra Hospital, Montreal, to be used for the treatment of erysipelas.

Nicol Kingsmill, K.C., Toronto, Canadian solicitor Michigan Central Rd., and his daughters are spending the winter in the south of France.

Miss Lilius Ahearn, only daughter of T. Ahearn, President Ottawa Electric Ry., was married Dec. 1 to H. S. Southam, of the Ottawa Citizen.

W. Whyte, Second Vice President C.P.R., Winnipeg, presided at a dinner of the Social and Moral Reform Committee, Regina, Sask., Dec. 3.

W. R. Baker, Secretary C.P.R., and assistant to President, Montreal, was married in New York, Dec. 6, 1909, to Miss Else Dicke, of Vienna, Austria.

S. N. Parent, Chairman National Transcontinental Railway Commission, has denied a recent rumor that he was about to resign to re-enter political life.

Miss Isabel Piers, daughter of A. Piers, Manager C.P.R. Atlantic Steamship Line, Liverpool, Eng., who has been visiting relatives in Canada, has returned to England.

Lord Strathcona had a narrow escape from a serious accident in London, Eng., Dec. 22, when his automobile collided with a motor bus. Though shaken, he was not hurt.

H. M. McCallum, General Agent C.P.R. Atlantic Steamship Lines, Winnipeg, and Miss J. B. Duncan, Winnipeg, were married Dec. 27, and sailed for a six weeks' tour in Europe.

R. H. Sperling, General Manager British Columbia Electric Ry., and Mrs. Sperling, who have been visiting Great Britain on their wedding trip, have returned to Vancouver.

Sir Thomas G. Shaughnessy, President C.P.R., left Montreal, Dec. 6, for New York, whence he sailed for Europe, to spend a short holiday on the Mediterranean, and then visit London.

C. H. F. Plummer, of the Canadian Lake and Ocean Navigation Co., who recently underwent an operation for appendicitis, is progressing satisfactorily at his home in Toronto.

F. Nicholls, director Canadian Northern Ry., sailed from New York, Dec. 22, for England, on account of the illness of his son, H. G. Nicholls, who was recently operated on for appendicitis.

Capt. Jas. Reid, of the Reid Wrecking Co., who was at Port Burwell, Ont., assisting the stranded car ferry, Ashtabula, received a paralytic stroke on Dec. 16, and was removed to his home at Sarnia, Ont.

H. Ingram, locomotive foreman C.P.R., Nakusp, B.C., was cut over the eye and had his lower jaw bruised, but was not seriously hurt, in the derailment of the C.P.R. Toronto express near Chapleau, Ont., Dec. 23.

W. E. Foster, who was recently appointed Assistant Solicitor G.T.R., Montreal, was born at Belleville, Ont., June 27, 1866, and has been connected with the G.T.R. Legal Department, since Sept. 30, 1884.

Four of the C.P.R. directors have been re-elected directors of the Bank of Montreal, viz., Lord Strathcona, Sir Thos. G. Shaughnessy, C. R. Hosmer and R. B. Angus, the former being Honorary President of the Bank.

Among the provisional directors of the recently incorporated York Club, Toronto, are, E. B. Osler, M.P., and W. D. Matthews, directors C.P.R.; W. Mackenzie, President C.N.R., and Z. A. Lash, K.C., director C.N.R.

W. Whyte, Second Vice President C.P.R., was a member of a deputation which waited on the Dominion Premier, Dec. 9, to ask for a grant of \$2,500,000 to the Selkirk Centennial Exposition to be held in Winnipeg 1912.

Sir H. Montague Allan and H. A. Allan, of the Allan Steamship Lines; C. M. Hays, President G.T.R., and K. W. Blackwell, Vice President Montreal St. Ry., have been re-elected directors of the Merchants' Bank of Canada.

The late B. J. Coghlin, Montreal, left \$200 each to the General Hospital and to the Notre Dame Hospital, Montreal, to provide life governorships for his two sons, B. W. P. Coghlin and G. J. R. Coghlin.

The following have joined the Canadian Ticket Agents' Association recently:—J. E. Finnegan, C.O.R., Bird's Creek, Ont.; C. G. Millard, C.P.R., Coldwater, Ont.; D. Goodwin, C.O.R., Gilmore, Ont.

Mrs. S. V. Paterson, wife of N. F. Paterson, K.C., Registrar at Osgoode Hall, who died in Toronto, Dec. 16, was the mother of N. F. Paterson, Inspector of Dining and Drawing Room Cars on the Chicago and North-West Ry., Chicago, Ill.

W. Downie, General Superintendent C.P.R. Atlantic Division, was married at St. John, N.B., Dec. 8, to Miss Charlotte Wilson, second daughter of the late Wm. Wilson, M.D., Q.C., of Quebec, the bride's brother-in-law, Rev. G. A. Kuhring, officiating.

H. Sutherland, Executive Agent Canadian Northern Ry., Winnipeg, is one of the provisional directors of the Canada's International Exposition and Selkirk Centennial Corporation, which has been incorporated in Winnipeg, under the Manitoba Companies' Act.

D. B. Hanna, Third Vice President Canadian Northern Ry., was the principal speaker at a dinner given by about 150 members of the National Club, Toronto, Dec. 11, to Noel Marshall, President Standard Fuel Co., in recognition of his services as director of the Club for 12 years and President for three years.

Mrs. M. A. G. Stanley, who died in Toronto, Dec. 10, aged 71, was a daughter of Mr. Garton, who was an engineer on the construction of the railway between St. John's, Que., and Rouse's Point, N.Y., and other early lines in Canada. One of her sons, E. Stanley, is a traveller for the Ontario Wind Engine and Pump Co.

W. McL. Walbank, who died in Montreal recently, was First Vice President of the Montreal Light, Heat and Power Co. He was one of the founders of the Canadian Society of Civil Engineers and was its President for 1904. He married a daughter of W. Richards, President of the Charlottetown Steam Navigation Co.

R. L. Nelles, formerly G.T.R. freight agent, Toronto, who was recently appointed General Agent Toronto Terminals, was presented with \$500 in gold, a mahogany roll top desk, and a mahogany rocking chair for Mrs. Nelles, Dec. 22, by the Freight Department employes, on his retiring from the former position.

While Geo. Moore, foreman motion shop I.C.R., Moncton, N.B., was superintending the loading of some iron on a flat car recently, one of the rods, which was thrown too far, struck him on the side, knocking him on to an adjoining track, breaking one of his ribs and dislocating a hip. He is progressing favorably.

H. J. Cowie, the Liverpool, Eng., representative of the Canadian Northern Ry., recently celebrated the completion of 25 years' service in Anglo-Canadian transportation business, by entertaining at dinner the representatives of the steamship companies doing business with Canada, and the representatives of Canadian railways in Liverpool.

G. C. Hopper, for many years Paymaster of the Michigan Central Rd., retired from active service Nov. 30. He had been in the service of the company and its predecessors, since 1846, with the exception of the years of the Civil War, during which he was in the Northern army. The directors passed a resolution expressive of appreciation of his services and provided for a pension.

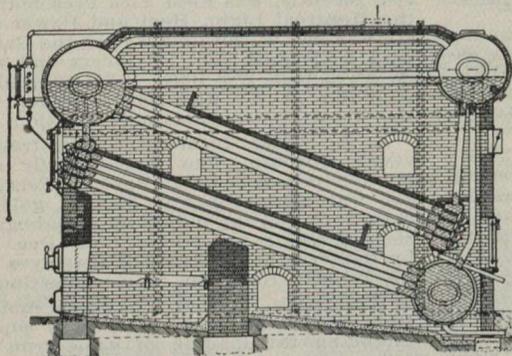
R. G. McNeillie, who was recently appointed acting District Passenger Agent C.P.R., Kootenay District, Nelson, B.C., was born at Lindsay, Ont., July 1, 1883, and entered railway service Oct. 1, 1901, in the C.P.R. Passenger Department, Winnipeg, since when he has held various positions there, having been for three years prior to Oct. 20, 1909, chief clerk General Passenger Agent's office, Winnipeg.

C. D. Fisher, who has been appointed Superintendent C.N.R., Dauphin, Man., was born at Athens, Ont., Aug. 24, 1867, his railway record being, 1888 to 1891, operator and agent C.P.R. at various points; 1891 to 1902, Train Dispatcher C.P.R., Moose Jaw, Sask.; 1902 to 1907, Chief Train Dispatcher C.P.R., Brandon, Man.; 1907 to 1909, Trainmaster and Chief Train Dispatcher G.T.P.R., Melville, Sask.; May 1 to Dec. 1, 1909, Chief Train Dispatcher C.N.R., Dauphin, Man.

S. J. Montgomery, who has been appointed City Freight and Passenger Agent C.N.R., Ottawa, was born at Kingston, Ont., Jan. 30, 1868, and entered railway service Feb., 1885, since when he has been, to May, 1887, operator G.T.R.; May, 1887, to May, 1889, operator C.P.R., Sudbury, Ont.; May to Sept., 1889, assistant agent C.P.R. North Bay, Ont.; Sept., 1889, to Jan., 1896, assistant ticket agent C.P.R. Windsor St. station, Montreal; Jan., 1896, to June, 1903, agent C.P.R., Bedford, Que.; June, 1903, to Dec. 6, 1909, chief clerk C.P.R. ticket office, Ottawa.

T. L. Willson, President International Marine Signal Co., Ottawa, has been awarded the McCharles Prize of \$1,000. This prize is the result of a bequest of the late A. McCharles, who left \$10,000, the interest of which is to be from time to time awarded to some Canadian who

ROBB-MUMFORD WATER TUBE BOILER



Straight Tubes
 Perfect Water Circulation
 Dry or Superheated Steam
 Half the Usual Number of Handholes

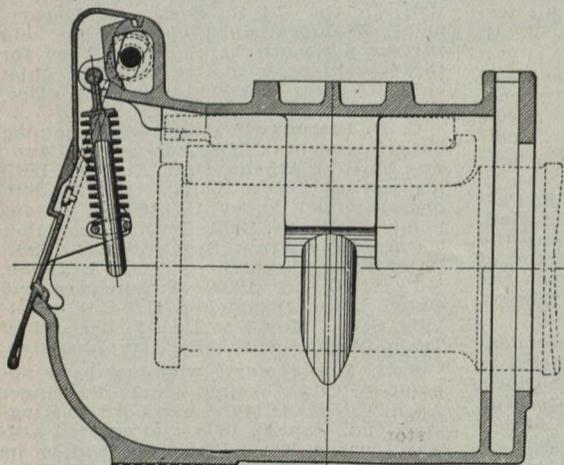
ROBB ENGINEERING CO., LTD.

AMHERST, N. S.

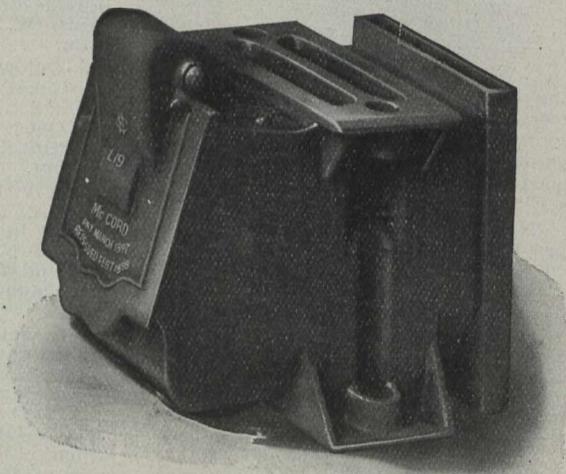
DISTRICT OFFICES: { 607 Canadian Express Bldg. MONTREAL, R. W. Robb, Mgr.
 Traders Bank Building, TORONTO, Wm. McKay, Manager.
 Union Bank Building, WINNIPEG, J. F. Porter, Manager.
 Calgary Block, Calgary, J. F. Porter, Manager.

THE McCORD MALLEABLE IRON JOURNAL BOX

MANUFACTURED IN CANADA



The
 Strongest,
 Lightest,
 Tightest
 Box Made



The McCORD Draft Gear
 The McCORD Spring Dampener

The McKIM Gasket
 The McCORD Force Feed Lubricator

McCORD & COMPANY
 Old Colony Building, Chicago

THE HOLDEN CO., Limited
 302 St. James Street, Montreal

discovers some new and practical process for treating Canadian ores, or for any device which will lessen the dangers and loss of life in connection with the use of electricity in supplying power and light, or for any marked public distinction in scientific research in any useful practical line.

E. Curry, until 1907, Secretary Treasurer Staten Island Ferry and Railway Co., who died recently at Staten Island, N.Y., aged 67, was born near Peterboro, Ont., in 1843, and entered business life as a telegraph operator and clerk, with the G.T.R. In 1866 he entered the Montreal Telegraph Co.'s service at Cobourg, Ont., as Assistant Manager, and was later appointed Manager. He was subsequently appointed in charge of the Northwestern Telegraph Co.'s office at St. Paul, Minn., and later, Assistant Secretary and Accountant same company. He moved to Staten Island in 1884, when he organized the Staten Island Ferry and Ry. Co.

J. C. O'Donnell, who has been appointed Trainmaster C.N.R., Dauphin, Man., was born at Cobden, Ont., Dec. 17, 1881, and entered transportation service Sept. 13, 1899, since when he has been, Apr. 2, 1901, freight brakeman C.P.R.; Apr. 2, 1901, May 1, 1902, conductor C.P.R., Chapleau, Ont.; June 17 to Sept. 18, 1902, freight brakeman C.P.R., Cranbrook, B.C.; Sept. 18, 1902, to Oct. 18, 1904, conductor C.P.R., Cranbrook, B.C., and Medicine Hat, Alta.; Nov. 3, 1904, to Jan. 15, 1905, switchman and engineer N.P.R., Jamestown, N.D.; May 16 to Nov. 30, 1909, with C.N.R., at Winnipeg.

F. Conway, acting General Superintendent and General Freight and Passenger Agent Kingston and Pembroke Ry., Kingston, Ont., whose portrait appears on the first page of this issue, was born at Ernestown, Addington county, Ont., Nov. 19, 1850. He entered railway service, Aug., 1869, since when he has been, to Feb., 1882, operator at Coteau, Que., relieving and station agent G.T.R.; Feb. to May, 1882, C.P.R. Freight Department; May, 1882, to Jan., 1883, agent Midland Ry. (now part of G.T.R.), Markham, Ont.; Jan., 1883, to date, General Freight and Passenger Agent Kingston and Pembroke Ry., Kingston, Ont., and since Oct. 1, 1906, also acting General Superintendent.

X. H. Cornell, who recently resigned the position of Master of Transportation G.T.R. Western Division, Durand, Mich., to become Chief Supervisor Michigan Car Demurrage Supervising Bureau, was in G.T.R. service for over 25 years, having been consecutively operator, dispatcher, Chief Dispatcher, Train Master, and, from 1903 to Nov. 30, 1909, Master of Transportation Western Division. He was entertained to dinner, at Durand, Mich., recently, by a number of his fellow officials, presided over by W. P. Fitzsimons, G.T.R. Commissioner of Industries, Montreal, and presented with a Knights Templar charm and chain set in diamonds, a gold cigar cutter and a sum of money in \$5 gold pieces.

T. W. Paterson, who has been appointed Lieutenant Governor of British Columbia, vice J. Dunsmuir, resigned, was born in Ayrshire, Scotland, in 1852, and came to Canada with his parents, who settled in Ontario. He has been closely connected with railway construction for many years, commencing work on the construction of the Toronto, Grey and Bruce Ry., now part of the C.P.R. He was also associated with the construction of the Welland Canal, and later was one of the many contractors on C.P.R. construction. He removed to British Columbia in 1885, where he continued in the same work, and also became connected with various navigation interests on the coast. He was a member of the B.C. Legislature from 1902.

Ernest Walton, who was recently ap-

pointed Travelling Car Service Agent G.T.R., Montreal, was born at London, Ont., Sept. 29, 1878, and entered G.T.R. service as messenger at Stratford, Ont., July 1, 1891, since when he has been, Mar., 1893, to July, 1896, stenographer to Master Mechanic, London; July, 1896, to May, 1899, stenographer to Superintendent, Toronto; May, 1899 to Mar., 1901, secretary to Vice President and General Manager, Central Vermont Ry., St. Albans, Vt.; Mar., 1901, to Feb., 1902, secretary and Assistant to President Southern Pacific Rd., San Francisco, Cal.; Feb., 1902, to July, 1903, secretary to Vice President and General Manager, Central Vermont Ry., St. Albans, Vt.; July, 1903, to Jan., 1905, chief clerk to Vice President and General Manager Central Vermont Ry., St. Albans, Vt.; Jan., 1905, to Sept. 30, 1909, chief clerk to Third Vice President G.T.R., Montreal.

C. H. Nicholson, who has been appointed Manager G.T.P.R. Pacific Coast Steamship Lines, Vancouver, B.C., was born at Belleville, Ont., and was educated there, at Queen's University, Kingston, Ont., and at the University of Maryland, Baltimore. He entered transportation service with the Richelieu and Ontario Navigation Co., and subsequently became purser on one of the steamers operated by C. F. Gildersleeve, on the Bay of Quinte and River St. Lawrence. He remained as purser for three years, and became captain, having charge successively of the Hero, Hastings, Norseman and North King. When C. F. Gildersleeve organized the Lake Ontario and Bay of Quinte Steamboat Co., he became General Freight Agent, and until 1903 represented its interests in the U.S., with headquarters at Rochester, N.Y. During the season of 1903 he was Manager of Transportation Muskoka Lakes Navigation and Hotel Co. at Gravenhurst, and from Feb., 1904, to Nov. 30, 1909, was Traffic Manager Northern Navigation Co., Sarnia, Ont.

Dominion Railway Subsidy Contracts.

The Dominion Government has entered into agreements with the following companies, providing the customary aid, for the construction of the following lines:—

MANITOULIN AND NORTH SHORE RY.—Nov. 23. From Stanley between Little Current and Sudbury, westerly to the Algoma Central and Hudson Bay Ry., not exceeding 100 miles; from Little Current, crossing the C.P.R. at Stanley, to Sudbury, not exceeding 64 miles; from Sudbury northerly, not exceeding 30 miles, in all, not exceeding 194 miles.

QUEBEC CENTRAL RY.—Dec. 7. For extension of line from St. George to or towards St. Justine, Que., 30 miles.

Passenger Meetings at Buffalo.—Several passenger associations will meet at the Lafayette Hotel, Buffalo, N.Y., on Jan. 18, 19 and 20. The Niagara Frontier Summer Rate Committee's rate representatives will meet on Jan. 18 and 19 at 10 a.m. to arrange details as far as possible for submission to the general meeting on Jan. 20 at 11 a.m. The Great Lakes and St. Lawrence River Rate Committee will meet immediately after the adjournment of the Niagara Frontier Summer Rate Committee's meeting.

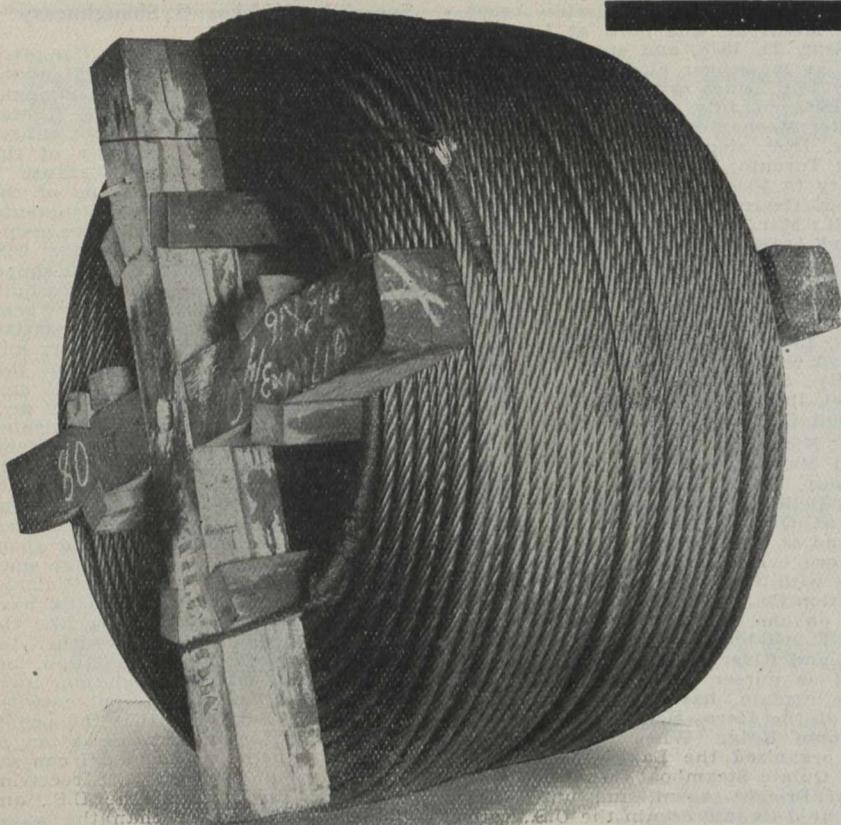
The Engineers' Club of Toronto held its annual meeting Dec. 16. Reports of the various committees and officers showed that the club was in a satisfactory condition. The following officers were elected for the current year:—Hon. President, J. Galbraith, LL.D.; President, Willis Chipman; First Vice President, C. M. Canniff; Second Vice President, Prof. R. W. Angus; directors, C. R. Young, W. V. Reynolds, W. A. Hare; Treasurer, L. J. Street; Secretary, R. B. Wolsey.

Speech by Sir Thos. G. Shaughnessy.

At the annual dinner of the Canadian Manufacturers' Association, Montreal branch, Dec. 2, Sir Thos. G. Shaughnessy, President C.P.R., said:—"I was reminded to-night that I was not entirely unqualified to be a member of the Manufacturers' Association, because I supervise in a general way one of the largest manufacturing establishments. Now, if there were no tariffs we could import our locomotives from the U.S. and save the expense of the Angus shops, but the 18,000 cars and locomotives built at a cost of \$20,000,000, would have been built elsewhere, and the \$20,000,000 would have gone out of the country and been lost forever to the people of this country. The five or six thousand men representing a population of 20,000 people for whom that work is furnishing employment, would not have been employed in this country, and you would have lost that population, and we would have lost the passengers and revenue resulting. When the C.P.R. was first opened for traffic in 1886, we had about 3,000 miles of railroad, which have since grown to about 10,000 miles in Canada, and the other railways of Canada have been progressing in something like the same proportion. We have rather too many railways for our population, because with our sparse population, there is not the requisite traffic, but notwithstanding this, I can say that the people of Canada are enjoying rates as low as any country in the world, and I can say that the men engaged are receiving wages equal to those in the U.S., and from 50 to 200% more than the wages in European countries. In a country like Canada, a railway has many functions to perform besides the mere carrying of passengers and freight, collection of revenue, and distribution of dividends when anything is left over for that purpose. I think at this stage we may look forward to the day when, with perfect lines of transportation, with our fields under cultivation, with our forests being worked intelligently, scientifically, with our minerals yielding yearly to the national wealth, with our manufactures, with our waterways deepened and improved, with our ports equipped, with an increased fleet on the Pacific Ocean, and faster ships on the Atlantic, that Canada may occupy the foremost place among the intelligent countries of the world, because while this work of progress is going on, education is not neglected and literature and the arts are encouraged. Canada a great nation—a powerful influence in the councils of the British people—unfailing in her devotion, in her fealty to the magnificent empire, with the protection that grew while she was growing—a nation self-reliant, self-confident, a nation honored and respected by her fellow-dominions in the Empire, a most potent factor in Imperial affairs."

The Central Railway and Engineering Club of Canada at its annual meeting in Toronto Dec. 21 elected the following officers:—President, J. Duguid, general foreman G.T.R. shops; First Vice President, G. Baldwin, general yardmaster Canada Foundry Co.; Second Vice President, J. Bannon, chief engineer city hall building; Executive Committee, C. A. Jefferis, W. R. McRae, O. A. Cole, A. M. Wickens, A. E. Till, A. Taylor, Toronto; R. T. Patterson, Stratford.

The Great Western Construction and Land Co., Ltd., has been incorporated under the Dominion Companies Act, with a capital of \$100,000 and office at Sudbury, Ont., to construct public works of all kinds, including railways, tramways, docks, harbors, piers, wharves, canals, etc. The provisional directors are: D. L. McKinnon, C. V. Price, Sudbury; W. E. Brown, C. W. Patton and J. W. Gamble, Ottawa.



Wire Rope

We manufacture and carry a complete stock of wire rope suitable for all requirements.

Ballast Cables, Wrecking Ropes, Switch Ropes

WIRE ROPE FITTINGS OF ALL DESCRIPTIONS

The Dominion **WIRE ROPE** Co., Limited
MONTREAL

JAS. W. PYKE & COMPANY

CANADIAN REPRESENTATIVES

FRIED. KRUPP, ESSEN, GERMANY

Steel Rails.
Wrought Iron Steel-Tyred Disc Wheels
Locomotive and Car Wheel Tyres.
Axles, rank Pins, Forgings, Etc.

FOR STEAM AND
ELECTRIC RAILWAYS.

OFFICE: SOVEREIGN BANK BUILDING,
232 ST. JAMES STREET,

MONTREAL



Iron or Wood Handle

Indestructible Convenient Perfect

THE DRAKE & WIERS CO.,

UWANTA WRENCH

Greatest strength of any on market.
Reinforced jaw. Double threaded screw of large proportions.

Write at once for Prices

CLEVELAND, OHIO

C.P.R. Betterments, Construction, Etc.

Entrance to Halifax.—H. M. Killaly, of the C.P.R. engineering staff, Montreal, arrived in Halifax, N.S., Nov. 29. He made an inspection of the waterfront at Halifax and Dartmouth, and then drove out to Bedford and Wellington, from Dartmouth. As soon as he had completed his survey work at Halifax, he went on to Amherst and other points on the suggested route for a line to connect up the C.P.R. with Halifax. At a public meeting in Amherst, Dec. 2, a number of prominent business men endorsed the plan, which so far is for the construction of a line to Harvey, N.B. No suggestions were made as to the route beyond this point. Letters were received at the meeting from Springhill and Parrsboro, endorsing the proposal.

St. Maurice Valley Ry.—Application is being made to the Dominion Parliament to extend for five years the time within which this company may complete the railway authorized to be constructed by sec. 8, chap. 123, of the statutes of 1904, as amended by sec. 1, chap. 156, of the statutes of 1905. Part of the line from Three Rivers northerly to near Shawinigan Falls has been completed.

Subway at St. Louis, Que.—Tenders were received to Dec. 6 by the town of St. Louis, Que., for the construction of a tunnel under the C.P.R. tracks on St. Louis Boulevard. This subway is being constructed at a total cost of about \$200,000, toward which the Board of Railway Commissioners has ordered the Montreal St. Ry. to contribute \$15,000.

Windsor St.—Place Viger Stations.—The Montreal Witness states that the attention of C.P.R. officials has again been turned to the old plan for connecting the Windsor and the Place Viger stations in Montreal, by a tunnel. The distance between these two stations is 1.25 miles, but freight trains run between them have to go round, 18 miles.

St. Lawrence Hall.—D. McNicoll, First Vice President, stated, Dec. 4, that the company's architects have been engaged for some time in preparing plans for the erection of a new building on the site of St. Lawrence Hall, Montreal, which the company purchased some years ago. Work will, it is said, be started in the spring, but it has not yet been decided whether it will be purely an office building, or whether arrangements would be made for the continuance of the hotel business there.

Ottawa, Northern and Western Ry.—A bill granting a further extension of time for the construction of the lines of railway authorized, has been approved by the Railway Committee of the House of Commons. The particular lines referred to in the bill, are those from Waltham to Grand Lake, from Waltham to Ottawa River, and from Shawville to Pembroke. A clause was added that 15% of the capital stock must be expended within two years.

Campbellford, Lake Ontario and Western Ry.—The Dominion Parliament is being asked to grant an extension of time within which this company may commence and complete its projected railway. When the bill came before the Railway Committee of the House of Commons, Dec. 9, it was stated that an extension of time had been granted in 1908 on the promise that construction would be gone on with immediately. On the statement of R. L. Fowke, M.P., who had charge of the bill, that he had been assured by the C.P.R. President that the line would undoubtedly be constructed, it was decided to report the bill.

South Ontario Pacific Ry.—The Railway Committee of the House of Commons, Dec. 9, approved a bill granting a further extension of time for the

construction of the railway and bridge authorized by the Company's act of incorporation, chap. 85 of the statutes of 1887.

Overhead Bridge, Guelph.—A proposition has been made by the C.P.R. to the city council of Guelph, Ont., to construct an overhead bridge over the line at the Eramosa road and Heffernan St. crossings, if the city will undertake the responsibility of protecting Allan's crossing.

West Ontario Pacific Ry.—The Dominion Parliament is being asked to grant the company an extension of time for the construction of the railway which the company was authorized by chap. 87 of the statutes of 1885, to construct.

St. Marys and Western Ontario Ry.—The by-law granting a bonus of \$20,000 to the St. M. and W.O.R. for the purpose of constructing a line through the township to Exeter, Ont., was carried by the taxpayers of Blanchard tp., Nov. 19. It is reported that a protest will be entered against the vote, as was done on previous occasions when the by-law was submitted.

Roundhouse at London, Ont.—When Sir Thos. Shaughnessy visited London, Ont., recently, he was reported to have said that seven new stalls would be added to the roundhouse in the yards there, and that a number of other improvements would be made. It is now reported that plans are in preparation for the erection of a new roundhouse of much larger dimensions than the present one, and that the latter will be taken down in the spring.

We are officially advised that Sir Thomas did not make any announcement respecting the London roundhouse and that no proposition was submitted to him.

Walkerton and Lucknow Ry.—Application is being made to the Dominion Parliament to grant an extension of time within which the company may construct the railway authorized by chap. 138 of the statutes of 1904.

Western Lines Construction.—We are advised that track was laid on the following extensions during 1909:—Extension of the Mowbray branch, from Mowbray to Windygates, Man., 7.00 miles, making the total length of the branch from La Riviere, 33 miles. Extension of the Broomhill branch from Broomhill to Tilton, Man., 8.4 miles. Completion of the Pheasant Hills branch from Wynyard to Lanigan Jet., Sask., 40.7 miles. Completion of the Saskatoon-Lacombe line, track being laid from Wilkie, Sask., to Hardisty, Alta., 136.6 miles. Extension from Weyburn to Forward, Sask., 26.00 miles. Lethbridge cut-off, Alta., 20.4 miles. Grade revision between Hector and Field, B.C., new track laid, 8.2 miles. The lines upon which construction has been done but upon which track has not been laid are:—Komarno to Icelandic River, Man., 29.2 miles; Virden to McAuley, Man., 14. miles; Regina to Craven, Sask., 23 miles; Langdon to Acme, Alta., 38 miles; Kipp to Carmanquay, Alta., 28 miles; Stettler to Caslor, Alta., 35 miles.

Manitoba and North Western Ry.—Application is being made to the Dominion Parliament to extend the time for the construction and completion of the branch lines authorized by chap. 106 of the statutes of 1906, and also authorizing the construction of additional lines, as follows:—From near Birtle, to Hamiota, Man.; and from Russell, Man., northerly or north-easterly for 150 miles. The company asks power to issue bonds for \$25,000 a mile in respect of these branches.

Birtle to Brandon, Man.—We understand that the question of the construction of a line from Birtle, via Hamiota to Brandon, Man., is under consideration,

but that nothing definite has been done in the matter.

Calgary and Edmonton Ry.—The Dominion Parliament is being asked to extend the time for the construction and completion of certain of the authorized lines, and also authorizing the construction of an extension of the Lacombe branch to Outlook, Sask., 200 miles.

Strathcona-Edmonton Bridge.—In connection with the high level bridge which the C.P.R. proposes to build across the North Saskatchewan River between Strathcona and Edmonton so as to give the Calgary and Edmonton Ry. entrance to the latter city, the Edmonton rate-payers have sanctioned an agreement made between the city and the company with reference to the entrance to the city over certain streets and lanes. It is proposed that the Dominion and Alberta Governments, the city of Edmonton and Strathcona municipality jointly defray the actual cost of increasing the rise of the bridge to accommodate vehicular and electric railway traffic. Till this matter has been decided and financial arrangements made, the bridge plant will not be perfected.

Hotel at Nelson, B.C.—We are advised that a proposal is under consideration for the erection of an additional small tourist hotel in the Nelson, B.C., district, but that nothing has been decided, either as to the locality in which the hotel will be erected, or as to when it will be built.

Columbia and Western Ry.—Application is being made to the Dominion Parliament to grant an extension of time for the construction and completion of the lines of railway which the company was authorized to construct by sec. 16, chap. 54, of the British Columbia statutes of 1896. The Dominion Parliament confirmed the charter in 1898, and has granted extensions of time for construction from time to time.

Electrification of Boundary Lines.—We are officially informed that the report that the recent trip of G. J. Bury, General Manager Western Lines, through the Boundary District, B.C., was with the object of passing upon plans for the substitution of electricity for steam on the C.P.R. lines in that territory, is entirely without foundation. A report that the lines in that district are to be operated by electricity has been current for several years, the most recent rumor being that "the reports of engineers detailed by the C.P.R. to investigate as to the advisability of electrifying their branch lines here (Phoenix, B.C.) have been so satisfactory that the project is seriously considered. The proposed initial electrification is to the Granby smelter." It was then added that G. J. Bury, was in the district to finally pass upon the project. When the reports were first made we were informed that the matter had been given some consideration by the company, but that the use of electricity for the haulage of trains had not reached that stage of development which would justify its adoption.

Nicola, Kamloops and Similkameen Ry.—The Dominion Parliament is being asked to grant an extension of time within which the company may commence and complete the construction of the lines authorized by sec. 3, chap. 47 of the British Columbia statutes of 1891, and by sec. 1, chap. 134 of the Dominion statutes of 1905.

Esquimalt and Nanaimo Ry.—We are advised that track has been laid from Wellington to Parksville, B.C., 18 miles, upon the extension of the line to Alberin. The remaining 40 miles from Parksville to Alberin, is under construction, the contract for the first 12 miles from Parksville, having been let to Dixon and Moore, and that for the remaining 28 miles to Jense, McDonnell and Timothy. The company has under consideration

DOMINION IRON & STEEL CO.

LIMITED

MANUFACTURERS OF

BASIC OPEN HEARTH STEEL RAILS

Order Books are now open for delivery during 1910. Intending Purchasers should place orders early to insure prompt delivery.

HEAD OFFICES
AND WORKS:

SYDNEY, CAPE BRETON, CANADA

The Hudson's Bay Company



THE COMPANY OFFERS FOR SALE

Farming and Grazing Lands in Manitoba and the Northwest Territories

ON EASY TERMS OF PAYMENT

Town Lots for Sale at Winnipeg, Ft. William, Edmonton, Prince Albert, etc.

The Company has General Stores at Winnipeg, Vancouver, Calgary, Edmonton, and other places where purchasers will find the best of goods at moderate prices.

Transportation by the Company's Steamers, brigades of boats and canoes throughout the Territories not traversed by railways.

Full information at the Company's Offices, Winnipeg, or 1 Lime St., London, E.C.

Canadian Gold Car Heating & Lighting Co. Ltd.

492 ST. PAUL STREET, MONTREAL, QUE.

MANUFACTURERS OF

Electric, Steam and Hot Water Heating Apparatus for Railway Cars

Catalogues and Circulars Cheerfully Furnished.

Improved System of Acetylene Car Lighting.

Send for Circular of our New Combination Pressure and Vapor Car Heating System

Largest Manufacturers in the World of Car Heating Apparatus

the construction of a branch line from Parksville to Comox, 45 miles. H. J. Cambie, Vancouver, B.C., is Chief Engineer in charge of construction.

The Dominion Parliament is being asked to extend the time within which the company may commence the construction of the extension of its main line to Comox, and branches which it was authorized to construct by chap. 14 of the British Columbia statutes of 1884; and the railway and branches which it was authorized to construct by sec. 2, chap. 92 of the Dominion statutes of 1906.

Minneapolis, St. Paul and Sault Ste. Marie Ry.—We are advised that the company has laid track on its extension into Duluth, between Superior and Duluth, and Moose Lake, 49.2 miles, and 45 miles westerly on the Moose Lake extension. This is the line which the company has under construction from Brooton to Duluth, upon which a train service has been in operation for some time from Brooton to Onamia, 86.5 miles. From Onamia to Moose Lake the distance is 53.97 miles, and the track laid as reported leaves a further distance of nine miles to complete the line.

The company has also let a contract to Foley, Welch and Stewart, St. Paul, Minn., for the construction of a line from Moose Lake, Minn., to Plummer, Wis., on the Wisconsin Central Rd., a distance of 180 miles.

Duluth, South Shore and Atlantic Ry.—During 1909 the company laid 7.1 miles of new track, as follows:—Wellsburg to Woods, Mich., 2.2 miles; Halfway to Davis mine at Megance, Mich., 2.1 miles; and Halfway to Valentine mine, Mich., 2.8 miles. On the Mineral Range Rd., owned by the D., S. S. and A. Ry., 2.87 miles of mining spur tracks were laid during the year, and surveys were made for another spur track of a mile to be constructed during 1910. (Dec., 1909, pg. 889).

A Railway to Hudson Bay.

A resolution was adopted unanimously by the Saskatchewan Legislature Dec. 4, and will be forwarded to the Governor-General in council, urging the necessity and importance of the immediate construction of a railway to Hudson Bay, and requesting the Government to make provision at the present session of Parliament for its actual construction.

The report of the Department of Railways for the year ended March 31, 1909, recently presented to Parliament, contains the full progress report of the special survey of the route, ordered last session of Parliament. On Dec. 13, there was laid before Parliament a further report from J. Armstrong, Chief Engineer in charge of the surveys. The Deputy Minister in introducing this report says he has amended Mr. Armstrong's estimates as to the cost of construction by substituting 80 lb. steel for 60 lb. steel, and by adding estimates for roundhouses, shops, buildings, elevators and yard facilities at terminals, and harbour work of which Mr. Armstrong did not take cognizance. The estimated cost of the Nelson line is placed at \$4,085,800; of station buildings, two 4,000,000 bush. elevators, yards at terminals, etc., at \$7,440,540, and of harbour works at \$5,000,000, a total of \$16,426,340. The cost of the Churchill line is placed at \$4,676,520; of station buildings, elevators, etc., \$7,757,152, and harbor works, \$6,675,000, a total of \$19,108,672. These estimates provide for facilities on a scale that will admit of the maximum capacity for a single track, passing tracks and telegraph stations every five miles, water stations every 15 miles, and roundhouse and shop accommodation to care for 32 freight trains and one express train every 24 hours. Piers and terminals have been placed at Port Nelson, as

from the information available there is no room for doubt that it is much the better harbor. The line is also 67 miles shorter; the country through which it runs is better, and the possibility of local business is altogether with the Nelson route. There is also a probability that a fair proportion of the route is available for settlement, whereas on the Fort Churchill route there is no such probability beyond Split Lake, where the lines separate. It is of the utmost importance that a hydrographic survey should be made of Hudson Strait and Bay, so that the position and cost of the necessary lighthouses may be ascertained. The course from Mansfield Island to Port Nelson requires to be accurately charted; it would be well also to secure information as to the harbors on the Labrador coast, and the special feature of Davis Strait. A good sea-going steamship is required at Nelson for a year or two to study the bay itself, its tides, currents, etc. The sea route from Port Nelson will pass to the north of Ireland, the distance to Liverpool being 3,200 miles, against 3,007 from Montreal to Liverpool.

The crux of the matter is, says the Deputy Minister, what business can be handled by such a railway and of what value is it likely to be to the country tributary to it. He estimates that with the exception of the southeasterly corner of Saskatchewan, the other portions of the province and the whole area of Alberta are tributary to The Pas. Assuming that the line is to be worked for all that is possible to be done. The grades are 0.4 or 21 ft. to the mile. All trains are fully loaded and composed of 40 ton pay load cars; and locomotives of the Mallet articulated compound type are to be used with a hauling power of at least 4,000 tons of pay load. Thirty-two trains per day is about the capacity of a single track—better than this has been done, but it is enough. Sixteen trains loaded equals 64,000 tons per day—making allowance for accidents and delays—say for 30 working days would give 1,930,000 tons, or 64,000,000 bushels of wheat. It is apparent that at least nine per day would need to be loaded, or say 135 to 140, to do the business—allowing two trips to each ship. Any additional business taken to the bay would have to be stored until the following August—nine months.

Other sources of traffic possible to the line are: the exportation of cattle; the usual package freight to and from Europe; and the possibility of developing a reasonably large import coal trade. It is practicable to lay down coal at Port Nelson from Nova Scotia at a cost not exceeding \$3.75 a ton. The rail haul say to Saskatoon—as an average point of distribution—need not exceed \$4 per ton, making the cost of the coal \$7.75. Equipment for 32 trains per day of the character outlined will cost about \$9,000,000; and means the providing of 108 train crews, 150 telegraph operators, 54 gangs of section men, shopmen, round house men, superintendents, train and yard masters—the greater number of whom are not likely to be required once the rush of the season is over. It appears, therefore, to be a difficult proposition for independent operation, and would seem to require to be worked by one of the large corporations, so that the men and rolling stock could be utilized the whole year. There is in Canada only one locomotive of the type described, and by using the largest freight engines now operated on western roads the train load would be reduced one-half—and the capacity of the road in like measure. It is apparent, however, that under any circumstances grain may be placed at the Hudson Bay on board ship as cheaply as at Fort William, hence the saving possible is 5c. per bushel, assuming that insurance and

freight rates are equal at Montreal and Port Nelson. Capt. Bernier is of the opinion that it is unsafe to be caught in the vicinity of the Fox channel with a steamship of ordinary construction, any later than Oct. 15.

Railway Y. M. C. A. at White River.

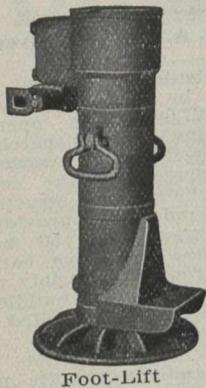
The Y.M.C.A. building erected at White River, Ont., by the C.P.R., at a cost of about \$27,000, was opened Dec. 11, H. B. Stevens, Chief Dispatcher, presiding, and W. B. Way, Assistant Superintendent, representing the company. The building is a frame structure with concrete foundation, providing sleeping accommodation for 50 men, with dining room, bowling alleys, baths, reading and social rooms. Possibly not one of the 250 railway Y.M.C.A. buildings on this continent has been provided to meet so great a need as this one. Its complete isolation, its destitution of social advantages, and its climate put this division point in a class by itself. The railway Y.M.C.A. buildings at Kenora, Schreiber, White River and Chapleau, none of which existed two years ago, form a remarkable group, offering as they do comfort and cheer to those who man the trains running through the wilds of New Ontario. In erecting these splendid buildings for the comfort and uplift of its employes, the C.P.R. has set a worthy example for other corporations employing large numbers of men. Letters endorsing the work achieved by the various associations already organized were read from D. McNicoll, Vice President; H. H. Vaughan, Assistant to the Vice President; F. P. Gutelius, General Superintendent Lake Superior Division, and A. Price, General Superintendent Western Division; and also from W. Whyte, Second Vice President, who said:—"The Y.M.C.A.'s have demonstrated that they are a great power and influence for uplifting humanity, and not only railway companies, but other corporations, are rapidly coming to realize that the building, operation, and maintenance of edifices for the associations is a good investment. The Railway Y.M.C.A. building at Kenora, which I had the pleasure of handing over to the management of the Y.M.C.A. in March last, is proving a great success as is shown by the fact that it has been found necessary to finish the upper story of the building as early as possible, and I had expected the accommodation provided would be quite sufficient for some time to come."

The Eastern Canadian Passenger Association has decided, as last year, not to make any reduced rates for the Montreal winter carnival, as it considers such affairs to be injurious to Canada's best interests.

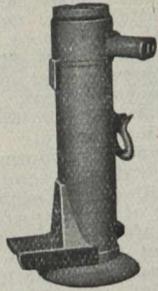
At the recent meeting of the Canadian Freight Association Western Lines, and the Canadian Car Service Bureau Western Lines, held in Winnipeg, the following officers and committees were elected for the current year: President, G. Stephen, General Freight Agent C.N.R.; Vice President, R. E. Larmour, General Freight Agent C.P.R.; Executive Committee and Audit Board, W. B. Lanigan, Assistant Freight Traffic Manager C.P.R.; G. H. Shaw, Freight Traffic Manager C.N.R.; Secretary-Treasurer, Manager and Chairman of Committees, H. R. Patriarche, 101 Bon Accord Bldg., Winnipeg. In addition to the foregoing officers, which are the same for each association, the first association named has a Freight Inspection Committee, consisting of G. Stephen and R. E. Larmour, and the latter association a Car Service Committee, consisting of D. C. Coleman, Superintendent Car Service C.P.R., and J. P. Driscoll, Superintendent Car Service C.N.R.

H & E Patent Ball-Bearing Lifting Jacks

For Railway and Bridge Work, Contractors' and Builders' Use



Foot-Lift



For Convenience, Speed and General Efficiency these Jacks are Unequaled. Are fully guaranteed. Being made of the best grades of Malleable Iron and Steel are strong and durable. Working parts entirely protected insure long wearing qualities. Sizes from 8 to 50 tons now complete. Send for prices and discounts.



Square Base

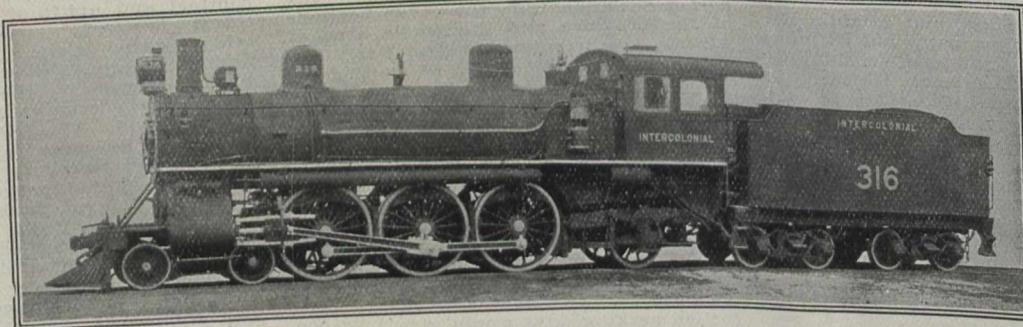


Journal Jack



Plain

MANUFACTURED BY **H & E LIFTING JACK COMPANY** = = **WATERVILLE, QUE.**
Stock carried by Frothingham & Workman, Limited Montreal



CANADIAN LOCOMOTIVE Co., LTD.,
KINGSTON, ONT.

Builders of Simple and Compound

LOCOMOTIVES

Adapted to every variety of service

THE CANADA IRON CORPORATION

Successor to:

LIMITED

CANADIAN IRON & FOUNDRY CO., LIMITED
CANADA IRON FURNACE CO., LIMITED
ANNAPOLIS IRON CO., LIMITED
JOHN McDOUGALL & CO., DRUMMONDVILLE

HEAD OFFICE

MONTREAL, P.Q.

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, Etc.
Castings of All Kinds

THE RAILWAY & MARINE WORLD

With which are incorporated The Western World and The Railway and Shipping World, Established 1890.

An Illustrated Periodical devoted to Steam and Electric Railway, Marine, Grain Elevator, Express, Telegraph, Telephone and Contractors' Interests.

ACTON BURROWS LIMITED. - Proprietors, 157 Bay Street, Toronto, Canada.
Local and Long Distance Telephone, Main 3201.

ACTON BURROWS, - Managing Director and Editor-in-Chief.

AUBREY ACTON BURROWS, - Secretary and Business Manager.

A. FENTON WALKER, - U S Representative, 143 Liberty Street, New York City.

Official Organ of

- The Canadian Freight Association.
- The Canadian Roadmasters' Association.
- The Canadian Street Railway Association.
- The Canadian Ticket Agents' Association.

SUBSCRIPTION PRICES, INCLUDING POSTAGE:

TORONTO AND WEST TORONTO POSTAL DELIVERY, \$1.25 a year.
To other places in CANADA, and to NEW-FOUNDLAND and GREAT BRITAIN, \$1 a year.
To the UNITED STATES and other countries in the Postal Union, except those mentioned above, \$1.50 a year, or six shillings sterling.
SINGLE COPIES, 15 cents each, including postage.

The best and safest way to remit is by express money order. Where one cannot be obtained a post office money order or bank draft payable at par in Toronto may be sent. Cheques or drafts not payable at par in Toronto cannot be accepted. Remittances should be made payable to THE RAILWAY AND MARINE WORLD.

NOTICE TO ADVERTISERS

ADVERTISING RATES furnished on application. ADVERTISING COPY must reach the publishers by the 10th of the month preceding the date of publication, if proof is required, or by the 15th if proof is not required.

TORONTO, CANADA, JANUARY, 1910.

Canadian Car Service Bureau.

EASTERN LINES—CHAIRMAN OF EXECUTIVE BOARD, M. MAGIFF, St. Albans, Vt.; MANAGER, J. E. DUVAL, 401 St. Nicholas Bldg., Montreal.
WESTERN LINES—MANAGER, H. E. Patriarche, 101 Bon Accord Building, Winnipeg.
BRITISH COLUMBIA LINES—MANAGER, E. J. Travers, Vancouver, B.C.

Canadian Freight Association.

PRESIDENT, J. J. Mossman, Buffalo, N.Y.; SEC. TREAS., T. Marshall, Toronto.
OFFICIAL ORGAN—THE RAILWAY AND MARINE WORLD, Toronto.
WESTERN LINES FREIGHT INSPECTION BUREAU—PRESIDENT, G. Stephen; MANAGER AND SEC. TREAS., H. R. Patriarche, Winnipeg.
BRITISH COLUMBIA LINES FREIGHT INSPECTION BUREAU—MANAGER, E. J. Travers, Vancouver, B.C.

Canadian Railway Club.

PRESIDENT, H. H. Vaughan, Montreal; SECRETARY, J. Powell, St. Lambert, Que. MEETINGS 1st Tuesday each month 8 p.m., except June, July and August.

Canadian Society of Civil Engineers.

PRESIDENT, G. A. Mountain, Ottawa; SECRETARY, C. H. McLeod, Montreal. MEETINGS at Montreal, alternate Thursdays, 8 p.m.

Canadian Ticket Agents' Association.

PRESIDENT, J. P. Hanley, Kingston, Ont.; SEC. TREAS., E. de la Hooke, London, Ont.
OFFICIAL ORGAN—THE RAILWAY AND MARINE WORLD, Toronto.

Central Railway and Engineering Club of Canada.

PRESIDENT, J. Duguid; SECRETARY, C. L. Worth, 409 Union Station, Toronto. MEETINGS at Toronto, 3rd Tuesday each month, except June, July and August.

Eastern Canadian Passenger Association.

CHAIRMAN, J. W. Hanley, St. Albans, Vt.; SECRETARY, G. H. Webster, 54 Beaver Hall Hill, Montreal.

Engineers' Club of Toronto.

PRESIDENT, Willis Chipman, Toronto.
SECRETARY, R. B. Wolsey, C.E., Toronto.

Great Lakes and St. Lawrence River Rate Committee.

CHAIRMAN, C. H. Nicholson, Sarnia, Ont.
SECRETARY, Jas. Morrison, Montreal.

Quebec Transportation Club.

PRESIDENT, F. S. Stocking.
SEC. TREAS., A. H. Davis, Box 350, Quebec.

Western Canada Railway Club.

PRESIDENT, G. Hall, Winnipeg; SECRETARY, W. H. Rosevear, Winnipeg. MEETINGS at Winnipeg, 2nd Monday each month, except June, July and August.

Alphabetical List of Advertisers

	PAGE
A	
Abbott, W.	Cover 1
Alexander Car Replacer Co.	70
Allis-Chalmers-Bullock, Ltd.	Cover 2
American Brake Shoe & Foundry Co.	48
American Hoist & Derrick Co.	28
American Vanadium Co.	12
B	
Babcock & Wilcox, Ltd.	80
Baldwin Locomotive Works	64
Bazwell Hoxie Wire Fence Co., Ltd.	60
Beatty, M., & Sons, Ltd.	68
Bertram John, & Sons, Co., Ltd.	4
Boker, Hermann, & Co.	72
Booth, L. M., Co.	Cover 1
Bowser, S. F., & Co., Ltd.	50
Bradstreet Company	75
Brevort Hotel, Chicago	52
Brown Hoisting Machinery Co.	8
Burns, R. M., & Co.	76
Burrows—Acton Burrows, Limited.	Cover 1
Butterfield & Co.	78
C	
Canada Car Co., Ltd.	24
Canada Iron Corporation, Ltd.	40
Canadian Bridge Co., Ltd.	70
Canadian Bronze Co., Ltd.	78
Canadian Crocker-Wheeler Co., Ltd.	46
Canadian Fairbanks Co., Ltd.	28
Canadian Gold Car Htg. & Ltg. Co., Ltd.	38
Canadian Locomotive Co., Ltd.	40
Canadian Northern Railway	56
Canadian Office & School Furniture Co., Ltd.	73
Canadian Pacific Railway Land Department	66
Canadian Railway Accident Insur. Co., Ltd.	74
Canadian Ramapo Iron Works, Ltd.	56
Canadian Rand Co., Ltd.	58
Canadian Westinghouse Co., Ltd.	Cover 2
Chicago Railway Equipment Co.	68
Cleveland City Forge & Iron Co.	66
Coddington, W. H.	78
Coghlin, B. J., & Co.	64
Commercial Acetylene Co.	Cover 1
Continental Iron Works	44
Crossen Car Mfg. Co. of Cobourg, Ltd.	42
D	
Date, John	72
Delaware and Hudson Co.	68
Dominion Bridge Co., Ltd.	4
Dominion Car & Foundry Co., Ltd.	Cover 52
Dominion Equipment & Supply Co., Ltd.	52
Dominion Iron & Steel Co., Ltd.	38
Dominion Wire Rope Co., Ltd.	36
Dougall Varnish Co., Ltd.	Cover 1
Drake & Wiers Co.	36
Drewry, E. L.	62
Drummond, McCall & Co., Ltd.	48
Dyner Co.	78
F	
Falls Hollow Staybolt Co.	74
Farlow Draft Gear Co.	54
Flannery Bolt Co.	46
Franklin Mfg. Co.	74
Fuce, E. O.	41
G	
Galena Signal Oil Co.	6
Gardner, J. T.	72
Gartshore, J. J.	70
Gartshore-Thompson Pipe & Fdry Co., Ltd.	70
General Railway Signal Co.	74
Goldschmidt Thermit Co.	72
Grand Trunk Railway	42
Greening, The B., Wire Co., Ltd.	76
H	
H. & E. Lifting Jack Co., Ltd.	40
Hamilton Pattern Works	Cover 1
Hamilton Steel & Iron Co., Ltd.	26
Harrison, John, & Sons Co., Ltd.	50
Hart, John A., & Co.	Cover 1

Hart-Otis Car Co., Ltd.	2
Hicks Locomotive & Car Works	76
Holden Co., Ltd., The	46
Hopkins, F. H., & Co.	38
Hudson's Bay Co.	38
Hunt, Robert W., & Co.	72
Hutton, James, & Co.	74
I	
Illinois Central Railroad	68
Imperial Bank of Canada	70
Imperial Guarantee & Accident Ins. Co., Ltd.	74
Intercolonial Railway	52
International Correspondence Schools	58
International Marine Signal Co., Ltd.	58
International Mercantile Marine Co.	66
J	
Jardine, A. B., & Co.	44
Jessop, Wm., & Sons, Ltd.	76
K	
Kerr Engine Co., Ltd.	62
Kingsmill, Saunders, Torrance & Kingsmill	41
L	
Legg Bros.	75
Lehigh Valley Railroad	78
Lewis, Rice, & Sons, Ltd.	48
Lufkin Rule Co.	Cover 1
M	
McAvity, T., & Sons	62
McConway & Torley Co.	64
McCord & Co.	34
Matheson, I., & Co.	66
Meaford Wheelbarrow Co., Ltd.	—
Metcalf, John S., Co.	78
Miller Chemical Engine Co.	78
Montreal Locomotive Works, Ltd.	10
Montreal Rolling Mills Co., Ltd.	60
Montreal Steel Works, Ltd.	14
Mussens Limited	Cover 1 and 16
N	
Northern Electric & Mfg. Co., Ltd.	—
Northern Engineering Works	78
Norton, A. O.	21
Nova Scotia Steel & Coal Co., Ltd.	30
O	
Ontario Wind Engine & Pump Co., Ltd.	68
Orford Copper Co.	78
Ottawa Car Co., Ltd.	Cover 1
Otto Bros.	70
Owen Sound Wire Fence Co., Ltd.	68
P	
Parry Sound Lumber Co., Ltd.	Cover 1
Phillips, Eugene F., Electrical Works, Ltd.	70
Piper, The Hiram L., Co., Ltd.	78
Piper, N. L., Railway Supply Co., Ltd.	50
Polson Iron Works, Ltd.	30
Positive Lock Washer Co.	78
Provincial Steel Co., Ltd.	76
Pyke, J. W., & Co.	36
Pyle National Electric Headlight Co.	26
R	
Rail Joint Co. of Canada, Ltd.	Cover 1 and 20
Renouf Publishing Co.	56
Rhodes, Curry Co., Ltd.	32
Robb Engineering Co., Ltd.	34
Russel Wheel & Foundry Co.	18
S	
Safety Car Heating & Lighting Co.	22
Saxby & Farmer, Ltd.	Cover 1
Scully Steel & Iron Co.	54
Silliker Car Co., Ltd.	22
Smart, James, Mfg. Co., Ltd.	54
Southern Press	74
Standard Coupler Co.	72
Standard Explosives, Limited	42
Standard Paint & Varnish Co., Ltd.	78
Standard Steel Works Co.	64
T	
Taylor & Arnold	44
Toronto Bolt & Forging Co., Ltd.	32
U	
Union Draft Gear Co.	72
United Typewriter Co., Ltd.	64
V	
Vulcan Iron Works	76
W	
Waugh Draft Gear Co.	Cover 1
Williams, A. R., Machinery Co., Ltd.	24
Williams Mfg. Co., Ltd.	74
Wire & Cable Co., Ltd.	Cover 1

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. CAN. SOC. C. E.
ONT. LAND SURVEYOR,
Consulting Civil Engineer
GALT, ONT.
Railway Location & Construction.
Reinforced Concrete Structures.

Kingsmill, Saunders, Torrance & Kingsmill,

Union Bank Chambers, 19 Wellington St. West, Toronto
Nicol Kingsmill, K.C., Dyce W. Saunders, K.C., W. P. Torrance, Walter B. Kingsmill.

W. T. RODDEN, Managing Director

J. F. JOHNSON, Secretary-Treasurer

T. L. GALLAGHER, Sales Manager

Standard Explosives

Limited

MANUFACTURERS OF

High Explosives and Blasting Powder,
and Dealers in Safety Fuse Deton-
ators, Batteries, Electrical Fuses, Etc.

OFFICE: BOARD OF TRADE BUILDING - - - MONTREAL
Works: L'ISLE PERROT, NEAR VAUDREUIL, P. Q.

CROSSEN CAR MFG. COMPANY OF COBOURG, LIMITED

MODERN HIGH-CLASS

ROLLING STOCK

Passenger, Freight and Electric Railway
Ruggles' Rotary Snow Plows

CAR CASTINGS, FORGINGS AND REPAIR PARTS

The Longest Continuous Double
Track Railway in the World
under One Management and the
only Double Track Line Between
Montreal, Toronto, Niagara
Falls, Detroit and Chicago.



Finest Roadbed in Canada.
Modern and Luxurious Trains.
Courteous Employees. Beautiful
Scenery. The Best of Everything
on this Popular Route.

4 FAST TRAINS, TWO EXPRESS AND TWO LIMITED

BETWEEN MONTREAL AND TORONTO, EACH WAY, DAILY

THROUGH TRAINS between BOSTON (via Boston & Maine R.R. and Cent. Vermont Ry.) MONTREAL, TORONTO
and CHICAGO.

THROUGH TRAINS between NEW YORK, TORONTO and CHICAGO via Lehigh Valley R.R. and Niagara Falls.
Dining and Parlor-Library-Cafe Cars on Day Trains. Pullman Sleeping Cars on Night Trains.

THE "INTERNATIONAL LIMITED"

The Lines of this Great System reach all the Principal Cities and Towns in Quebec and Ontario.

W. E. DAVIS, Passenger Traffic Manager, MONTREAL.

G. T. BELL, Asst. Pass. Traffic Manager, MONTREAL.

G. W. VAUX, Gen. Passenger and Ticket Agent, MONTREAL.

The "Railway Greyhound of Canada," the finest
and fastest train in the Dominion, runs every
day in the year between Montreal and Chicago.

Canadian Northern Ry. Construction, Etc.

Canadian Northern Ontario Ry.—The line from Hawkesbury via Rockland, to Ottawa, 59 miles, was inspected and passed for the operation of freight and passenger trains by the inspecting engineers of the Department of Railways, Dec. 3. A through train service from Quebec and Montreal to Ottawa was put in operation by the Canadian Northern Quebec Ry., Dec. 5. As a result of the refusal of the Board of Railway Commissioners to confirm an agreement with the Ottawa City Council, by which the line would cross Hurdman's Road at rail level, the company has had to erect a temporary station at Gladstone Ave. It is intended to construct a subway instead of a level crossing, and when this is done the line will connect with one of the existing lines near the University oval and run into the Central station.

In connection with the securing of the right of way for the line from Toronto to Ottawa, of which the section from Toronto to Trenton is under contract, the C.N.O. Ry. paid \$17,800 into court, and has to pay \$30,000 more into court, to enable it to enter into possession of certain lands required for its right of way in the vicinity of Toronto, the value of which is being settled by arbitration. Construction is proceeding with considerable rapidity. It is reported that the fencing along nearly the whole of the right-of-way has been put up. Between Trenton and Brighton, over four miles of grading has been completed, and considerable stretches have also been graded in the vicinity of Colborne, and other points between Cobourg and the Don Valley. An effort is being made by the residents of the lake front towns to induce the company to change the route of the line easterly from Trenton, so that it will take in all the lake shore territory, striking the C.N. Quebec line at Hawkesbury, from which point the company has already a connection with Ottawa. W. Mackenzie, President C.N.R., on his return to Toronto from Halifax, N.S., recently was waited upon by a deputation representative of the lake front towns between Toronto and Prescott, to urge consideration of the matter.

D. D. Mann, Vice-President C.N.R., said in an interview in Toronto, Dec. 16: "We will erect repair shops and a roundhouse in Toronto next summer. Should we be given the right of entry, Ashbridge's Marsh will probably be the site on which they will be built. When our eastern and western lines are coupled up we will have to have very extensive shops in Toronto. And as our eastern line is being built under a year's contract, and should be finished, as far as Trenton next fall, we will have to start constructing these shops in the summer. They will be large enough for the requirements of our two lines running out of Toronto, and will be so arranged that extensions can be made just as fast as the exigencies of business demand. The suggestion has been made that Ashbridge's Marsh would be an excellent site, and should the city grant us the right to construct a line down there the district may be adopted." In connection with this matter the company's application for a right-of-way on the east bank of the Don into the Ashbridge Bay district have been left over with the Toronto City Council of 1910 to deal with.

Plans were filed Dec. 8, showing a proposed plan of entry of the company's line from Toronto to Buffalo, into Hamilton. The plans show a route over the ton. The plans of the Toronto, Hamilton and C.P.R. and the Toronto, Hamilton and Buffalo Ry. A Hamilton report says that the C.P.R. objects to the plan on the ground that the Hunter St. tunnel is not calculated to accommodate more than the present traffic.

Engineering parties are in the field in the vicinity of the Nipigon River and

Lake in connection with the surveys for the line to connect the C.N.O. Ry. near Sudbury, with the C.N.R. at Port Arthur. One party is reported to be at work between Nipigon River and Long Lake, and another between Nipigon River and Black Sturgeon River. It is expected that the new line will cross the Nipigon River at Deschamps, a short distance north of the C.P.R.

Canadian Northern Ry.—Application is being made to the Dominion Parliament to authorize the construction of the following lines of railway: from Dundee, northerly and easterly, to the Winnipeg River; Portage la Prairie, southerly and easterly, to tp. 2, r. 7, e.p.m.; Hartney, westerly, to tp. 5, r. 7, w. 2, m.; Moose Jaw, southerly and easterly, to Bienfait with a branch from near Estevan to Roche Percee. Between Davidson and Disley on the Qu'Appelle, Long Lake and Saskatchewan Rd., westerly and north-westerly, to the Saskatoon-Calgary line; Lashburn, westerly, to between Camrose and Edmonton; Saskatoon-Calgary line near tp. 28, r. 6, w. 4 m. to Rocky Mountain House; Saskatoon-Calgary near the crossing of Red Deer River, north-westerly, through or near Innisfail and Rocky Mountain House to head waters of Brazeau and McLeod Rivers and to Yellowhead Pass; Winnipegosis, southerly, to constructed line near south end of Lake Manitoba; from authorized line between Prince Albert and Battleford near tp. 49, r. 3, w. 3 m., north-westerly and northerly to Great Slave Lake; from authorized line east of Lake Manitoba, westerly, via the Narrows to its constructed line between Grandview and Roblin. The company asks power to issue bonds to the amount of \$25,000 in addition to \$5,000 a mile for the specific purposes mentioned in sec. 4, chap. 50, of the statutes of 1902, and excepting that in respect of any of the lines constructed west of the easterly limit of the foothills of the Rocky Mountains, bonds to the value of \$35,000 a mile may be issued. The decision of the Minister of Railways shall be final as to the limit of the easterly limit of the foothills of the Rocky Mountains.

The bill also provides for an extension of time for the construction of the following lines authorized by sec. 2, chap. 92 of the statutes of 1908:—from Strathcona, southerly to Calgary, Alta.; from Regina, south-westerly to the International boundary between ranges one and four west of the third meridian, Sask.; from near Russell, on the Rossburn branch, westerly via Yorkton, to near Goose Lake, Sask.; from 10 miles north of the company's line between Winnipeg and Ste. Anne, Man., generally southerly to the boundary of Manitoba; from near Battleford, Sask., generally westerly to the Brazeau River, Alta.; from near Regina northerly to Humboldt, thence north-easterly down the valley of the Carrot River to a point near Pas Mission on the Saskatchewan River; and from between Humboldt and the South Saskatchewan River, north-easterly to the crossing of the South Saskatchewan River near the company's Prince Albert branch, and the bill further provides for further extending the time for the construction of the following lines:—from Prince Albert, Sask., to Edmonton, Alta.; from Swan River, Man., westerly to the Saskatchewan River, (partially constructed); from the Morden and North-Western Ry. between Neepawa and the westerly boundary of Manitoba, thence northerly to the line between Grandview and Battleford, Sask.; from near Regina, north-westerly and westerly to the Red Deer River, Alta., with a branch from west of the Saskatchewan River northerly to tp. 45, r. 4, west of the third meridian; the railway authorized to be constructed by the Winnipeg and Hudson Bay Ry. and Steamship Co. (partly constructed) from Winnipeg to Fort Nel-

son or Fort Churchill or some other point on Hudson Bay; the line commencing at the end of the 40 miles constructed by the Winnipeg and Great Northern Ry., thence to St. Laurent, or Oak Point, on Lake Manitoba, and thence generally northerly to the Grand Rapids on the Saskatchewan River, (partially constructed); the line authorized to be constructed from near the Narrows of Lake Winnipeg, Man., to near Battleford, Sask., thence to Edmonton, Alta., and on to the Pacific Coast, near the Skeena River, by way of Pine River Pass, or other feasible pass; and the partially constructed line from McCreary station, Man., passing through Cartwright to the southern boundary of the province.

W. Mackenzie, President, stated in a recent interview in Toronto, that the company had completed over 400 miles of track during 1909, and had finished the surveying of a route from Edmonton, Alta., to Vancouver, B.C. As soon as the necessary sanction had been given by the British Columbia Legislature to the agreement made with the Government, construction work would be proceeded with on the line to Vancouver.

The Supreme Court of Ottawa gave judgment Dec. 13, in the case in which the Canadian Northern Ry. appealed against an order of the Board of Railway Commissioners requiring it to fence certain portions of its railway. The court dismissed the appeal as to enclosed lands, but allowed it so far as unenclosed lands are concerned.

Edmonton and Slave Lake Ry.—The Dominion Parliament is being asked to authorize the company to amalgamate with the C.N. Ry. Co.

Yellow Head Pass to Vancouver.—We are officially advised that during last summer and fall an instrumental survey was made of the North Thompson River valley from Kamloops to Cranberry Lake, and a location projected thereon has been approved for 88 miles north from Kamloops. This survey was made by C. F. Hanington and Jno. Irvine, in charge of parties working from Cranberry Lake south and from Kamloops north, respectively. These two parties are now working, Hanington from Cranberry Lake easterly towards Yellow Head Pass, Irvine from Kamloops westerly, down the South Thompson. A survey of the Fraser River valley was also made during the summer from seven miles up the South Thompson above Lytton, westerly, for 37 miles, by J. V. Nimmo, to a junction with a party in charge of W. K. Gwyer, working easterly up from Yale, which party has since been running the line from Yale westerly towards New Westminster, where they were expected about the end of 1909. Of this work, 15 miles from Yale up the Fraser River and 5 miles from Lytton down, have been approved and plans for the remainder are now before the Government for approval or in course of preparation. T. H. White is the chief engineer in charge of the surveys.

Duluth, Winnipeg and Pacific Ry.—A U.S. press report states that contracts are about to be let for the construction of an extension of the Duluth, Rainy Lake and Winnipeg Ry., from near Virginia to Duluth, Minn., about 70 miles. Surveys have been completed for the projected line, the only point in regard to which there is any uncertainty is the entry into Duluth. (Dec., 1909, pg. 895.)

The brakeman was a novice, and on his first run there was a stiff grade to mount, on which the engineer always had more or less trouble, but this time he came near sticking. At the station at the top of the grade, the engineer saw the new brakeman, and with a sigh, said: "I tell you what, my lad, we had a job to get up there, didn't we?" "We certainly did," replied the brakeman, "and if I hadn't put the brake on, we'd have slipped back."

STEEL CASTINGS

— FOR —

Locomotives, Steam Shovels, Car
Equipment, etc.,

TAYLOR & ARNOLD - Montreal

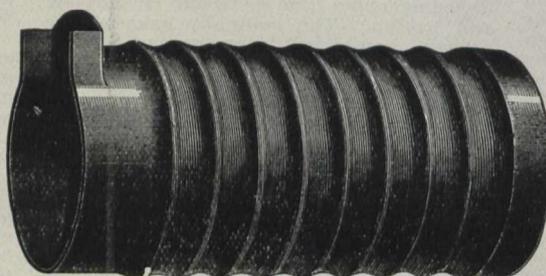
L. S. ROUGH, General Sales Agent.

Foundry at WELLAND, ONTARIO, CANADA

MORISON Suspension Furnaces

The Universally
satisfactory record of
"THE MORISON"
proclaims it the best
furnace made.

With Plain Ends or Flanged
to any required shape.



For Land and
Marine Boilers

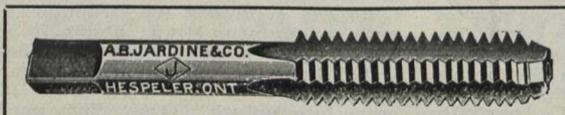
Uniform Thickness, Easily
Cleaned, Unexcelled for
Strength, Unsurpassed for
Steaming Capacity.

Manufactured by

THE CONTINENTAL IRON WORKS, WEST AND CALYER STS.
BOROUGH OF BROOKLYN.
Near 10th and 23rd St. Ferries. **NEW YORK**

Sole Canadian Agent—MR. GEORGE HOLLAND, M.C. Soc. C.E., P.O. Box 529, MONTREAL

"Jardine" Taps for the Boiler Shop
"Jardine" Taps for the Machine Shop
"Jardine" Taps for all Purposes



Send us your specifications for special Taps.
We have the appliances.
Delivery and price will please you.

There are no better Tools than "Jardine" Tools.

ASK FOR OUR CATALOGUE No. 13.

A. B. Jardine & Co. - - Hespeler, Ont.

Railway Rolling Stock Notes.

The Michigan Central Rd. has ordered four Pacific type and four switching locomotives from the Montreal Locomotive Works.

The Silliker Car Co., Halifax, N.S., has recently received orders for one passenger and 10 flat cars from the Anglo-Newfoundland Development Co.; and 100 box cars from the C.N.R.

The d'Israeli Asbestos Co., which has a short railway connecting its asbestos mines with the works at d'Israeli, Que., is in the market for a locomotive, some cars and other equipment.

The Northern New Brunswick & Seaboard Ry. will probably be in the market for some locomotives, ore and other cars in the near future. G. E. Drummond, 28 Victoria Square, Montreal, is President.

The Canadian Northern Ontario Ry., in view of the increasing development of the Moose Mountain and Mond Nickle Co.'s properties, has ordered 100 steel ore cars from the Canadian Car & Foundry Co., Montreal.

The C.P.R., between Nov. 15 and Dec. 9, received the following additions to rolling stock: 90 box cars, one flanger, four vans, two store supply cars and five M-4 locomotives from its Angus shops, Montreal, and one 75-ton wrecking crane from the U.S.

The Diamond Ry. and Coal Co. operating in Alberta owns one locomotive, one passenger coach and two flat cars. It uses C.P.R. cars for shipping coal from its Diamond City mines. It does not expect to be in the market for any more rolling stock for some time.

The G.T.P.R. has received the following additions to rolling stock, between Nov. 2 and Dec. 16, 1909: five parlor-cars, nos. 3,900 to 3,904, from the Canada Car Co., Montreal; six baggage cars, nos. 412 to 417, from Rhodes, Curry Co., Amherst, N.S.; and five snow plows, nos. 395,003 to 395,007, from the U.S.

The C.P.R., between Nov. 15 and Dec. 9, placed orders for rolling stock as follows: 18 baggage and express cars, two mail and express cars, 120 box cars, 34 flat cars and three vans at its Angus shops, Montreal; 1,000 40-ton steel frame box cars from the Canadian Car and Foundry Co., Montreal, and one 75-ton wrecking crane in the U.S.

The Intercolonial Ry. has ordered a Pacific type locomotive from the Montreal Locomotive Works, of which the following are the chief particulars:—

Weight in working order	198,500 lbs.
Weight on drivers	133,500 lbs.
Weight on engine truck	30,700 lbs.
Weight on trailer	34,300 lbs.
Wheel base, driving	12' 7"
Wheel base, engine	31' 6"
Wheel base, engine and tender	57' 11"
Wheel base, engine and tender	21" by 28"
Cylinders	72"
Driving wheels, diar.	Extended wagon top.
Boiler, type	63 1/2"
Boiler, diar.	200 lbs.
Boiler pressure	232—2 1/4"
Tubes, no. and diam.	19' 0"
Tubes, length	19 ft.
Firebox	96" by 70"
Capacity, water	5,000 imp. gals.
Capacity, coal	10 tons.
Truck	4-wheeled with steel bolster.
Wheels, diar.	33"
Wheels	W.I. centres, steel tire.
Journal	5" by 9"
Brake beam	Steel.

Following are the chief particulars of consolidation locomotive which the Toronto, Hamilton and Buffalo Ry. has ordered from the Montreal Locomotive Works:—

Weight in working order	197,000 lbs.
Weight on drivers	172,000 lbs.
Weight on engine truck	25,000 lbs.
Weight on trailer	17' 0"
Wheel base, driving	25' 9"
Wheel base, engine	57' 3"
Wheel base, total, engine and tender	Walschaert
Valve gear	21 1/2" by 28"
Cylinders	55"
Driving wheels, diar.	Extended wagon top.
Boiler, type	68 1/4"
Boiler, diar.	200 lbs.
Boiler pressure	353—2"
Tubes, no. and diar.	15' 0"
Tubes, length	15' 0"

Brakes	Westinghouse American.
Capacity, water	7,000 U.S. gals.
Capacity, coal	10 tons.

Following are chief particulars of the two mogul locomotives which the Quebec Central Ry. has ordered from the Canadian Locomotive Co., Kingston, Ont.;—

Weight on drivers	113,500 lbs.
Weight, total	144,000 lbs.
Wheel base of engine, rigid	13' 6"
Wheel base of engine, total	23' 8"
Wheel base of engine and tender	50' 4"
Heating surface, firebox	138 sq. ft.
Heating surface, tubes	1518 sq. ft.
Heating surface, total	1656 sq. ft.
Driving wheels, diar.	66"
Driving wheel centres. Main, cast steel; others	cast iron.
Driving journals	9" by 10"
Cylinders	19" by 26"
Boiler type	Extended wagon top.
Boiler, pressure	200 lbs.
Tubes, no. and diar.	223—2"
Tubes, length	13' 0"
Brakes	Westinghouse ET
Weight of tender loaded	104,000 lbs.
Capacity, water	4,300 gals.
Capacity, coal	9 1/2 tons.
Truck	4-wheeled with steel bolster.
Wheels, diar.	33"
Wheels	W.I. centres, steel tire.
Journal	5" by 9"
Brake beam	Steel.

Following are chief particulars of the 10 Pacific type and two consolidation locomotives which the Montreal Locomotive Works is building for the Michigan Central Rd., as mentioned in our last issue.

	Pacific.	Consolidation (236).	Consolidation (274).
Weight in working order	245,500 lbs.	236,000 lbs.	274,000 lbs.
Weight on drivers	154,500 lbs.	211,000 lbs.	211,000 lbs.
Weight on engine truck	44,000 lbs.	25,000 lbs.	25,000 lbs.
Weight on trailer	47,000 lbs.	25,000 lbs.	25,000 lbs.
Wheel base, driving	13' 0"	17' 6"	19' 0"
Wheel base, engine	33' 7 1/2"	26' 5"	54' 5 1/2"
Wheel base, engine and tender	65' 8 1/2"	60' 11"	54' 5 1/2"
Cylinders	22" by 26"	23" by 32"	24" by 28"
Driving wheels, diam.	75"	63"	51"
Boilers, type	Straight top, extended stay.	Straight top, extended stay.	Extended wagon top, radial stay.
Boilers, diam.	75"	63"	51"
Boilers, pressure	200 lbs.	200 lbs.	210 lbs.
Tubes, no. and diam.	394; 2"	446; 2"	447; 2"
Tubes, length	21' 0"	15' 0 1/2"	19' 0"
Valve gear	Walschaert.	Walschaert.	Walschaert.
Brakes	Westinghouse.	Westinghouse.	Westinghouse.
Capacity, water	7,000 U.S. gals.	7,500 U.S. gals.	8,000 U.S. gals.
Capacity, coal	12 tons.	12 tons.	12 tons.

The Intercolonial Ry. has ordered a Pacific type passenger locomotive from the Montreal Locomotive Works, of which the following are the chief particulars:—

Weight on drivers	126,000 lbs.
Weight, total	187,000 lbs.
Cylinders	21" by 28"
Drivers, outside diameter	72"
Boiler pressure	200 lbs.
Heating surface, tubes	2,584 sq. ft.
Heating surface, firebox	162 sq. ft.
Tubes, no. and diam.	232; 2 1/4"
Tubes, length	19 ft.
Firebox	96" by 70"
Capacity, water	5,000 imp. gals.
Capacity, coal	10 tons.
Axles	Open hearth steel.
Brakes	Westinghouse.
Brake beams	Simplex.
Brake shoes	American Brake Shoe & Fdry. Co.
Couplers	M.C.B. or other.
Headlight	Pyle National Electric.
Journal bearings	McCord. 5 1/2" by 10"
Steam heat equipment	Safety Car Htg. & Ltg. Co.

Following are the chief particulars of the 10 consolidated locomotives, which the Canadian Locomotive Co., Kingston, Ont., is building for the Intercolonial Ry., as mentioned in our last issue.

Weight on drivers	148,300 lbs.
Weight, total	164,850 lbs.
Cylinders	21" by 28"
Drivers, diam.	56"
Boiler, type	Straight top.
Boiler, pressure	200 lbs.
Heating surface, tubes	1,934.6 sq. ft.
Heating surface, firebox	161.1 sq. ft.
Heating surface, total	2,095.7 sq. ft.
Tubes, no. and diam.	236; 2 1/4"
Tubes, length	14 ft.
Firebox	114" by 41"
Grate area	32.5 sq. ft.
Capacity, water	5,000 imp. gals.
Capacity, coal	10 tons.
Axles	Open hearth steel.
Brakes	Westinghouse.
Couplers	Janney.
Headlight	Pyle National Electric.
Steam heat equipment	Safety Car Htg. & Ltg. Co.

Following are the general dimensions and chief particulars of the 10-wheel locomotives which the C.P.R. is building at its Angus shops, Montreal, as mentioned in our last issue.

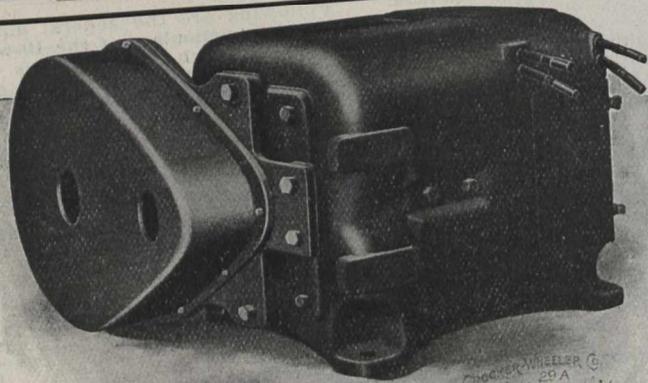
Weight on drivers	141,000 lbs.
Weight, total	190,000 lbs.
Cylinders, diam. and stroke	22 1/2" by 28"
Drivers, diam.	63"
Boiler, type	Wagon top, radial stayed.
Boiler, pressure	180 lbs.
Heating surface, tubes	2,263 sq. ft.
Heating surface, superheater	408 sq. ft.
Tubes, no. and diam.	24, 5"; 244, 2"
Tubes, length	14' 6"
Firebox, length	8' 4 7/8"
Firebox, width	5' 9 3/4"
Firebox, heating surface	190 sq. ft.
Grate area	49 sq. ft.
Capacity, water	5,000 gals.
Capacity, coal	10 tons.
Air brakes	Westinghouse E. T. 6
Axles	C.P.R.
Brake beams	Simplex, diamond inside hung.
Brake shoes	C.P.R.
Couplers	C.P.R. standard.
Headlight	Pyle National Electric.
Journal bearings	C.P.R. standard.
Springs	C.P.R. crucible steel.
Steam gauges	Star.
Wheel centres	Cast steel.
Tractive effort	34,400 lbs.
Weight on drivers+tractive effort=	5.5
Tractive effort÷di. drivers+heating surface=	96.1
Heating surface+grate area=	46.1
Heating surface, firebox+heating surface without superheater=	11.9
Weight on drivers+total heating surface=	52.8
Total weight÷heating surface=	84.
Heating surface÷vol. cylinders=	175.

	Consolidation (236).	Consolidation (274).
Weight on drivers	236,000 lbs.	274,000 lbs.
Weight, total	211,000 lbs.	211,000 lbs.
Weight on engine truck	25,000 lbs.	25,000 lbs.
Weight on trailer	25,000 lbs.	25,000 lbs.
Wheel base, driving	17' 6"	19' 0"
Wheel base, engine	26' 5"	54' 5 1/2"
Wheel base, engine and tender	60' 11"	54' 5 1/2"
Cylinders	23" by 32"	24" by 28"
Driving wheels, diam.	63"	51"
Boilers, type	Straight top, extended stay.	Extended wagon top, radial stay.
Boilers, diam.	63"	51"
Boilers, pressure	200 lbs.	210 lbs.
Tubes, no. and diam.	446; 2"	447; 2"
Tubes, length	15' 0 1/2"	19' 0"
Valve gear	Walschaert.	Walschaert.
Brakes	Westinghouse.	Westinghouse.
Capacity, water	7,500 U.S. gals.	8,000 U.S. gals.
Capacity, coal	12 tons.	12 tons.

Following are chief particulars of the 10 consolidation locomotives which the Intercolonial Ry. has ordered from the Canadian Locomotive Co.:—

Weight on drivers	148,300 lbs.
Weight, total	164,850 lbs.
Wheel base of engine, rigid	15' 3"
Wheel base of engine, total	23' 6"
Wheel base of engine and tender	54' 5"
Length over all, engine and tender	65' 1"
Width over all, engine and tender	10' 2"
Height over all, engine and tender	14' 6 1/2"
Driving wheels, diar.	56"
Driving wheel centres. Main, cast steel; others	cast iron.
Driving journals	8" by 12"
Cylinders	21" by 28"
Boiler, type	Radial stayed.
Boiler pressure	200 lbs.
Tubes, no. and diar.	236—2 1/4"
Tubes, length	9' 6"
Brakes	Westinghouse
Weight of tender loaded	120,000 lbs.
Capacity, water	5,000 gals.
Capacity, coal	10 tons.
Truck	Diamond, all steel.
Wheel, diar.	34"
Wheels	W.I. centres, steel tired.
Journal	5 1/2" by 10"
Brake beam	Steel.

C.P.R. Land Settlement.—Press dispatches from England say that Sir Thos. G. Shaughnessy, President C.P.R., stated in the course of an interview the company's intentions as to the future land settlement in Western Canada, as follows:—"Recently, when 1,600 small holdings were offered in England there were 35,000 applicants. All these could be accommodated in Canada. We propose to prepare land for this class of small holder, build his house and fence holding, break part of the soil and sow it, so that he can come and find all ready to settle down. This will be within reach of an English countryman, who has £100 capital to make a start."



ENCLOSED TYPE MOTORS

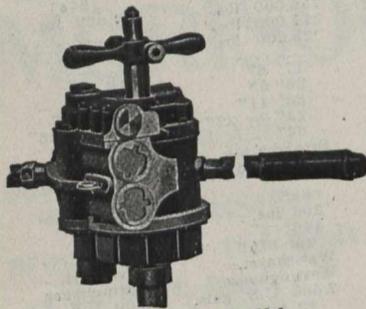
FOR

Cranes, Industrial Railways, Hoists, Etc.

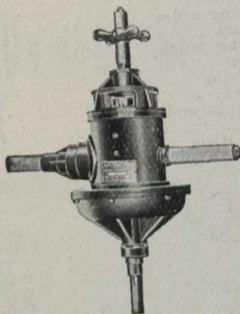
WRITE FOR PARTICULARS

CANADIAN CROCKER-WHEELER CO., Limited
Manufacturers and Electrical Engineers - 41 Street Railway Chambers, Montreal

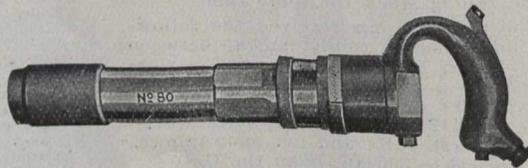
ALL RAILROADS AND USERS OF COMPRESSED AIR KNOW THESE TOOLS



LITTLE GIANT DRILL



DUNTLEY ELECTRICAL DRILL



NEW BOYER RIVETING HAMMER

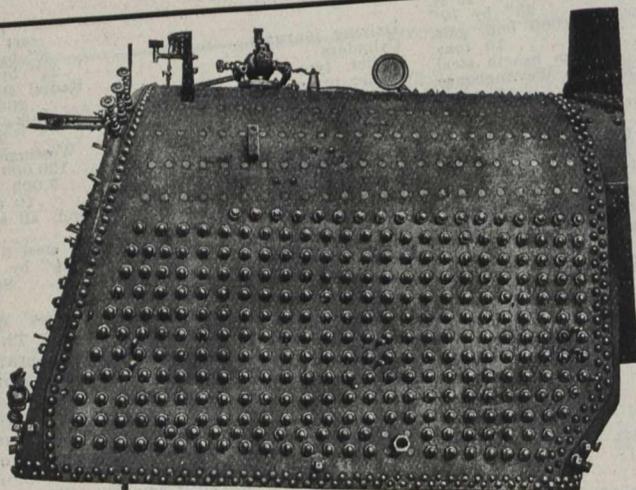
The Chicago Pneumatic Tool Co. have recently re-designed some of their LITTLE GIANT Drills, and have placed on the market several new types, and also some additional pneumatic devices. Write us for Catalogue No. 30, just issued.

THE HOLDEN COMPANY, LIMITED

MONTREAL
302 St. James St.

TORONTO
42 York St.
Address Nearest Office

WINNIPEG
291 Portage Ave.



An installation of the Tate Flexible Stay.

THE TATE FLEXIBLE STAYBOLT

THE PERFECT STAY

For Locomotive Fire Boxes

Over two millions and a half bolts in service on over 125 railroads throughout the United States

Manufactured and Sold in Canada by
CANADA FOUNDRY COMPANY, Limited
TORONTO, ONT.

AGENTS FOR THE

Flannery Bolt Company,

Pittsburgh, Penn., U.S.A.

Railway Finance, Meetings, Etc.

Alberta Ry. and Irrigation Co.—Approximate net profits from all sources, exclusive of land sales for Oct., 1909, \$52,722, against \$32,544 for Oct., 1908. Cumulative net profits for four months ended Oct. 31, 1909, \$161,278. Traffic receipts for Nov., 1909, \$40,860, against \$39,424 for Nov., 1908. Aggregate traffic receipts for five months ended Nov. 30, 1909, \$175,554.

Atlantic and Lake Superior Ry.—A meeting has been called to be held in London, Eng., Jan. 11, for the purpose of approving an agreement of sale of the railway.

We were advised Dec. 11 that the Baie des Chaleurs Ry. (Atlantic and Lake Superior Ry.) had not then been taken over, but it is expected that the transfer will be formally made at the end of Jan.

Columbia and Western Ry.—The Supreme Court gave judgment Dec. 13 in the action brought by R. B. Angus and Sir Thomas G. Shaughnessy, against A. Heinze for a partition of the lands forming the C. and W. R. land grant. When this line was acquired for the C.P.R. it was agreed that the lands granted by the B. C. Legislature should be divided in certain proportions. The lower courts held that the agreement obliged the purchasers to hold the title in the lands until Heinze asked for a conveyance of his share. This decision has been upheld by the Supreme Court.

Dominion Atlantic Ry.—Gross earnings for Oct., 1909, \$136,400, against \$130,515 for Oct., 1908. Aggregate earnings for four months ended Oct. 31, 1909, \$610,400, against \$469,067 for same period 1908.

Duluth, Rainy Lake and Winnipeg Ry.—A block of the authorized and outstanding \$2,000,000 first mortgage sinking fund 5% bonds of 1906-1916, is being offered at Milwaukee, Wis., at 101 to 101½. These bonds are prior in lien to an outstanding issue of \$1,525,000 Duluth, Winnipeg and Pacific Ry. second mortgage bonds, guaranteed principal and interest by the Canadian Northern Ry.

Grand Trunk Railway.—Application is being made to the Dominion Parliament for an act authorizing the company to acquire, and dispose of the bonds, debentures or other securities issued by the Ottawa Terminals Ry., and by the G.T. Pacific Terminal Elevator Co.

Grand Trunk Western Ry.—The property of the Pontiac, Oxford and Northern Ry., which has been in the hands of a receiver for about two years, has been acquired by the G.T.R., and will be operated as a part of the G. T. Western Ry. The P.O. & N.R. is 100.2 miles long, and connects Pontiac, Mich., with Imlay City, on the Detroit, Grand Haven and Milwaukee Ry., also controlled by the G.T.R. It owns seven locomotives, 11 passenger cars and 81 freight cars.

Quebec and Lake St. John Ry.—Traffic receipts for Nov., 1909, \$53,251.05, against \$57,742.65 for Nov., 1908. Aggregate traffic receipts for 11 months ended Nov. 30, 1909, \$550,984.11, against \$588,075.37 for same period 1908.

Quebec and New Brunswick Ry.—A meeting has been called to be held at Edmundston, N.B., Jan. 19, for the election of directors; to re-affirm all past resolutions and bylaws, as far as possible, and generally to settle on what shall constitute the records, books and other papers of the company, all of which were destroyed by fire in Apr., 1909; to ratify all past acts of the directors and President; to declare forfeited all shares on which default has been made, and to transact other business.

St. Lawrence & Adirondack Ry.—Quarter ended September 30, 1909, gross

earnings \$155,893 against \$141,247 previous year; net earnings \$43,642 against \$60,040 previous year, deficit after charges of \$8,169 as compared with surplus previous year of \$22,329.

Temiscouata Ry.—Net profit on operation for Sept., 1909, \$4,566, and for nine months ended Sept. 30, \$40,099.

Railway Commissioners' Traffic Orders.

Summaries of other traffic orders are given on another page under "Orders by Railway Commissioners":—

8860, Dec. 10.—Re complaint of Grain Growers' Grain Co. of Winnipeg, alleging long delay on the part of railway companies in repayment to shippers of grain for lumber supplied for car doors; and re complaint of J. J. Denman and others of the Province of Alberta, complaining of unjust treatment afforded them by the Canadian Northern and Canadian Pacific Ry. Cos. in compelling complainants to furnish doors or boards for the interior of cars supplied to them for shipments of coal; upon hearing the above complaints in the presence of counsel for the applicants, in so far as the former orders hereinafter referred to are concerned, as well as of counsel for the C.P.R., the C.N.R. and the G.T. Pacific Ry. Cos., and upon counsel representing that serious difficulty is likely to arise in connection with the operation of the orders in these matters, made Feb. 2 and 19, 1909, in so far as they direct at the time of shipment payment to the shipper out of funds of the railway company in the hands of its agent, it is ordered:

1. That the orders of Feb. 2 and 19, 1909, be hereby rescinded.

2. That where shippers upon all or any railways subject to the jurisdiction of the Dominion Parliament are compelled to furnish car doors to enable cars to be used for traffic, allowance therefor to such shippers be made upon the following basis: At and west of Fort William, lower car door, \$1; upper car door, 50c. East of Fort William, upper or lower car door, each, 50c. And that adjustment between the said shipper and the railway company shall be made by the agent of the railway company at or nearest to the point of shipment, by permitting the shipper to deduct from the freight charges, if any, payable by him upon the shipment in such car for which the said door or doors were so supplied, the amount of such bill upon the foregoing basis, the said shipper receipting the same for the amount so allowed and turning the account in to such agent as so much cash.

3. In the event of the shipper not prepaying the freight upon the shipment with reference to which such car door or doors are so furnished, then the railway company shall, within 30 days from the date of such shipment, reimburse to the shipper the sums payable upon the above basis for the door or doors so furnished by him.

Regulations re Locomotives.

The Board of Railway Commissioners passed the following order 8903 Dec. 15. Re order 3245, dated July 4, 1907 (published in the Railway and Marine World Aug., 1907, pg. 577), and re application of Michigan Central Rd. to amend said order, the said order is hereby amended by striking out clause (b) in the second paragraph and substituting therefore the following:

"(b) Overflow pipes from lifting injectors or water pipes from injector delivery pipe or boiler to be put into the front and back part of the ash pans and used during the months of April, May, June, July, Aug., Sept. and Oct. for wetting ash pans."

G.T.R. Betterments, Construction, Etc.

Sherbrooke, Que.—The G.T.R. is reported to be acquiring land at Sherbrooke for yard extensions, with a view, it is said of making a divisional point there. The present divisional point between Montreal and Portland, Me., is at Island Pond, Vt., and the report further states that this divisional point is to be abandoned, and another one established at Groveton, N.H. This would mean two divisional points where there is now one.

Turcot and St. Lambert Improvements.—We are advised that the only work being done at Turcot yards is in connection with the diversion of the Montreal Park and Island Ry., and that there is no other work contemplated at either Turcot or St. Lambert at present.

Sunnyside Crossing, Toronto.—The Board of Railway Commissioners made an order Dec. 10, in regard to the proportionate cost to be borne by the various parties interested in the separation of the grades at the Sunnyside crossing, Toronto. For the crossing at the Humber in Etobicoke tp., the Dominion Government will pay out of the level crossings fund \$5,000, and the township \$8,000; in York tp. there are three crossings to be eliminated towards which the Dominion will pay \$15,000, and the township a like amount; for the work in the city of Toronto the Dominion will contribute \$15,000. The balance of the cost is to be divided and paid, one-third by the City of Toronto (so far as the work is in the city) and the remaining two-thirds by the G.T.R. The cost is to be figured out on the basis of a two-track viaduct, and the work has to be completed within two years. The G.T.R. desired to have a proportion of the cost assessed upon the C.P.R. which has running rights over the line, but the Commissioners declined to take any action thereon. The City Engineer of Toronto said the carrying out of the order would mean the doing away of ten level crossings within the limits of the city's authority, for the protection of which it was now paying \$3,000 a year.

Bridge at Weston Road.—The City Engineer of Toronto recommends that the bridge over the C.P.R. tracks at Weston Road, West Toronto, be extended so as to cross the G.T.R. tracks also, and proposes to ask for an appropriation to cover the cost of a new bridge.

Waterloo, Ont.—The company proposes to erect an improved station at Waterloo, Ont., during the year.

Electrification of Branch Lines.—The Mayor of Berlin, Ont., had an interview with U. E. Gillen, Superintendent, Middle Division, at Toronto, Dec. 3, with reference to the proposal to electrify the branches from Berlin to Galt and Elmira. Mr. Gillen said the cost of operation proved an obstacle when the matter was under consideration a few years ago. The advent of the Hydro-Electric Power Commission's plant might affect the question. The residents of Berlin are preparing to organize a deputation from the district to wait on the management at Montreal to urge consideration of the matter.

Relaying Track.—The tracks on the lines running into Palmerston, Ont., from Stratford, and other points, was relaid with heavier steel during 1909. It is intended during 1910 to continue the work on the three lines running out of Palmerston northerly and westerly.

London Track Elevation.—The Mayor of London received a communication from the Chairman of the Railway Commission to the effect that the question of the elevation of the G.T.R. tracks in London had been taken up by the Commissioners. It was expected that the question would be fully gone into early in the New Year, and a meeting of all parties arranged for in London. (Dec., 1909, pg. 891.)

ATTENTION, MASTER CAR BUILDERS!

The M. C. B. rules of interchange provide for the use of THE STEEL BACK BRAKE SHOE on your freight equipment.

The use of OUR STEEL BACK SHOE will mean a saving in brake shoe maintenance, brake heads and brake beams.

THE STEEL BACK BRAKE SHOE is an economy on all railway equipment.

LET US PROVE IT TO YOU

American Brake Shoe and Foundry Company

NEW YORK

MAHWAH, N.J.

CHICAGO, ILL.

THE HOLDEN CO., Limited, Agents, 302 St. James St., MONTREAL

*We carry the most extensive
assortment of Tools and
Equipment in Canada*

Full Lines of

FORGES, TRACK JACKS, LEVER
JACKS, HYDRAULIC JACKS,
HYPER-ACME CHAIN BLOCKS,
ROPE BLOCKS of all kinds, VICES,
ANVILS, Etc., Etc. : : :

Let us have your enquiries. Prices are right

RICE LEWIS & SON, LIMITED, - TORONTO



THE ALGOMA STEEL CO., LIMITED

SAULT STE. MARIE, ONTARIO

IS NOW BOOKING
ORDERS FOR

STEEL RAILS

FOR DELIVERY DURING
THE SEASON OF 1909

Parties intending purchasing will find it to their interest to let us have their specifications at an early date so as to insure desired deliveries.

Office:
CANADA LIFE BUILDING
MONTREAL

DRUMMOND, McCALL & CO.
GENERAL SALES AGENTS

TRANSPORTATION APPOINTMENTS.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Canadian Northern Quebec Ry., Canadian Northern Ontario Ry. (Ottawa Section), Quebec and Lake St. John Ry.—S. J. Montgomery has been appointed City Freight and Passenger Agent, Ottawa. He was heretofore chief clerk C.P.R. Ticket Office, Ottawa.

Canadian Northern Ry.—A. Wilcox, heretofore Superintendent Division 3, Dauphin, Man., has been appointed Superintendent Division 1, succeeding M. A. Murphy, resigned. Office, Port Arthur, Ont.

C. D. Fisher, heretofore Chief Dispatcher Division 3, Dauphin, Man., has been appointed Superintendent Division 3, vice A. Wilcox, transferred. Office, Dauphin, Man.

W. E. Roberts, heretofore Trainmaster, Dauphin, Man., has been appointed Chief Train Dispatcher there, vice C. D. Fisher, promoted.

J. C. O'Donnell, heretofore conductor, North Battleford, Sask., has been appointed Trainmaster District 3, with headquarters at Dauphin, Man.

Canadian Northern Ry., Duluth, Rainy Lake and Winnipeg Ry.—W. E. Dunn has been appointed Travelling Passenger Agent, St. Paul, Minn.

G. R. Hall has resigned the position of Commercial Agent at Chicago, Ill., to become Secretary of the Traffic Commission of the Commercial Club of Duluth. See also Duluth, Rainy Lake & Winnipeg Ry.

Canadian Pacific Ry.—In consequence of the removal of the division point from Woodstock, N.B., to Aroostook Jct., N.B., Locomotive Foreman McIninch will be transferred from Woodstock to Aroostook Jct. in January.

W. A. Cowan, heretofore Resident Engineer, London, Ont., has been appointed Resident Engineer at Farnham, Que., vice A. C. MacKenzie, transferred to Assistant Chief Engineer's office, Montreal.

H. Frawley has been appointed Locomotive Foreman at Three Rivers, Que., vice J. Gregoire, deceased.

L. S. Rudder, heretofore on the Resident Engineer's staff, Toronto, has been appointed acting Resident Engineer there, vice F. W. Cooper, transferred to London, Ont.

F. W. Cooper, heretofore Resident Engineer, Toronto, has been appointed Resident Engineer at London, Ont., vice W. A. Cowan, transferred to Farnham, Que.

R. Armstrong, heretofore General Agent, Fort William, Ont., has been appointed Superintendent of Terminals, Fort William, vice G. E. Graham, transferred to Vancouver, B.C.

J. H. Wilson was on Dec. 18 appointed Locomotive Foreman at Kenora, Ont., vice T. F. Patterson, transferred.

W. A. James has been appointed Division Engineer of Construction Western Lines, vice J. Callaghan, resigned. Office, Winnipeg.

G. Twist, heretofore Locomotive Foreman, Sutherland, Sask., was on Nov. 24 appointed Locomotive Foreman at Minnedosa, Man., vice W. F. Lowe, transferred to the Winnipeg shops. On Dec. 18 A. Crawford was appointed acting Locomotive Foreman at Minnedosa.

J. H. Wilson, heretofore Locomotive Foreman at Moose Jaw, Sask., was on Nov. 24 appointed Locomotive Foreman at Sutherland, Sask., vice G. Twist, transferred to Minnedosa, Man. On Dec. 21 A. Morrison was appointed Locomotive Foreman at Sutherland, Sask., vice J. H. Wilson, transferred to Kenora, Ont.

R. Anthony, has been appointed acting Locomotive Foreman, Moose Jaw, Sask., vice J. H. Wilson, transferred.

W. Price, heretofore Car Inspector at Macleod, Alta., has been appointed Car Foreman, Swift Current, Sask., vice J. A. Jenson, transferred.

J. A. Jenson, heretofore Car Foreman at Swift Current, Sask., has been appointed Car Inspector at Red Deer, Alta.

H. McDonald has been appointed Locomotive Foreman, Macleod, Alta., vice H. Stevenson, assigned to other duties.

G. E. Graham, heretofore Superintendent of Terminals, Fort William, Ont., has been appointed Superintendent District 2, Pacific Division, vice W. O. Miller, on leave of absence. Office, Vancouver, B.C. W. O. Miller will, on his return, be transferred to another district.

J. G. McNab, heretofore Travelling Freight Agent B.C. and Pacific Coast Steamship Service, has been appointed Contracting Freight Agent C.P.R., Vancouver, B.C., vice W. H. Gardiner.

A. Davidson has been appointed Travelling Freight Agent, B.C. and Pacific Coast Steamship Service, Vancouver, B.C., vice J. G. McNab.

Duluth, Rainy Lake & Winnipeg Ry.—D. T. Murphy, heretofore Trainmaster, has been appointed acting Superintendent, succeeding M. A. Murphy, resigned. Office, Virginia, Minn. (See also Canadian Northern Ry.)

Grand Trunk Pacific Ry.—C. H. Nicholson, heretofore Traffic Manager Northern Navigation Co., Sarnia, Ont., has been appointed Manager G.T.P.R. Steamship Lines on the Pacific Coast. He will have supervision of all matters pertaining to marine and steamship business for the company on the Pacific coast, the operation and maintenance of steamers, docks, etc., with such other duties as may be assigned to him from time to time. Office, Vancouver, B.C.

Grand Trunk Ry.—C. M. Hays, heretofore Second Vice President and General Manager, has been elected President, and will also continue to act as General Manager, effective Jan. 1, as announced in our Nov., 1909, issue. We are officially advised that there will be no changes of importance in the official staff as a consequence.

W. Sealy, heretofore machinist charge hand, Stratford shops, has been appointed erecting shop foreman there, vice A. J. Roberts, who has left the service.

W. Davis, heretofore in the Stratford shops, has been appointed machinist charge hand there, vice W. Sealy, promoted.

H. F. Sauser has been appointed General Yardmaster at Black Rock, N.Y., vice G. F. Sullivan, assigned to other duties.

J. Ehrke, heretofore Trainmaster 25th District, Durand, Mich., has been appointed Assistant Superintendent 25th and 26th Districts, Main Line. Office, Battle Creek, Mich.

R. Doyle has been appointed Master of Transportation, Western Division, Durand, Mich., vice X. H. Cornell, resigned to become Manager Michigan Car Service Bureau.

O. F. Clark has been appointed Trainmaster 25th District, Durand, Mich., vice J. Ehrke, promoted.

The following agents have been appointed:—Woodville, Ont., W. R. Dickson; Kirkfield, Ont., H. F. Parks; Thornbury, Ont., T. E. Lord; Harley, Ont., W. G. Baker; St. Polycarpe, Que., L. G. LaBatt (temporary); Carlsbad Spring, Ont., J. A. Marchand.

Grand Trunk Western Ry.—C. M. Hays, President, issued the following circular Dec. 1:—"The Pontiac, Oxford and Northern Rd., having passed under the control of this company, the jurisdiction of all officers of the respective departments of this company are hereby extended over that railway. Their instructions will be obeyed accordingly."

Intercolonial Ry.—N. McNeil has been appointed Foreman of Car Department at Sydney, N.S., vice R. Dunlap.

Northern Navigation Co.—H. H. Gildersleeve, Manager, has assumed the duties hitherto discharged by C. H. Nicholson, Traffic Manager, the latter having resigned to enter G.T.P.R. service. The Manager's office will be changed from Collingwood to Sarnia, Ont.

Toronto, Hamilton and Buffalo Ry.—G. C. Martin, heretofore chief clerk, has been appointed Assistant General Freight and Passenger Agent. Office, Hamilton, Ont.

Trade and Supply Notes

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers to distinctly understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

Large and useful wall calendars have been received from Mussels Limited, Montreal, and the B. Greening Wire Co., Ltd., Hamilton, Ont.

Taylor & Arnold, 404 St. James St., Montreal, have been appointed general sales agents of the Ontario Iron & Steel Co. and the Canadian Railway Equipment Co., whose works are at Welland, Ont. L. S. Hough, heretofore sales agent for the two companies, is now on Taylor & Arnold's staff, and will devote his attention to sales.

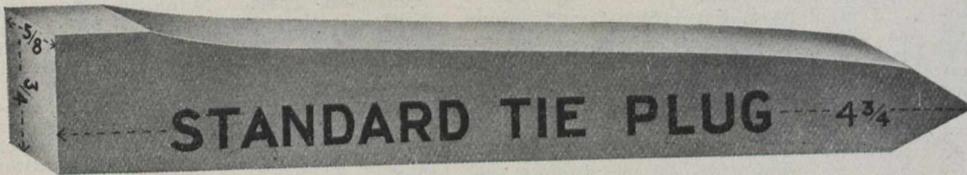
The Tallman Brass and Metal Co., Hamilton, Ont., after being located on Wellington St. North for 13 years, have removed to a new factory and foundry on Wilson St., east of Sanford Ave., which are well equipped with the most up-to-date machinery and appliances. They manufacture "Arctic metal" and brass castings and also handle pig tin and lead.

The Canadian Fairbanks Co., Ltd., has been appointed exclusive sales agent for Canada for Dicks' Balata Belting and has purchased J. S. Young's business. Orders should be sent direct to the nearest branch house. Large stocks are carried at present at Montreal and Vancouver, and stocks are on the way to the branches at St. John, N.B., Toronto and Winnipeg.

A powerful self-propelling grab dredge has just been completed to the order of the Egyptian Government for the Upper Nile. This is the third dredge which the Sudan Irrigation Department is placing upon the work of rectification of the Upper Nile upon which it is engaged and by means of which the potentiality of the river for irrigation purposes will be greatly increased. The first dredge is of the dipper type for embanking purposes and is already in service. The second is of the hydraulic type and is now being erected at Khartoum, while the third dredge is intended to deal with the sudd and will be provided with appliances for cutting the sudd as well as removing it. This vessel is built in the form of a light draft river steamer, 160 ft. long by 32 ft. beam and 2 ft. 9 ins. draft. The three dredges have been built to the designs and specifications of A. W. Robinson, M. Can. Soc. C.E., of Montreal, Consulting Engineer to the Sudan Irrigation Department.

An order in council has been passed providing for the imposition of a fine of \$20 in the case of anyone found guilty of spitting in any passenger car, on any railway platform or other premises of the Government railways, and for the imposition of a similar penalty for smoking elsewhere than in places or compartments, in stations or cars, designated for that purpose.

"Note the Size and Shape"



In bags of 1000 each

Write for prices

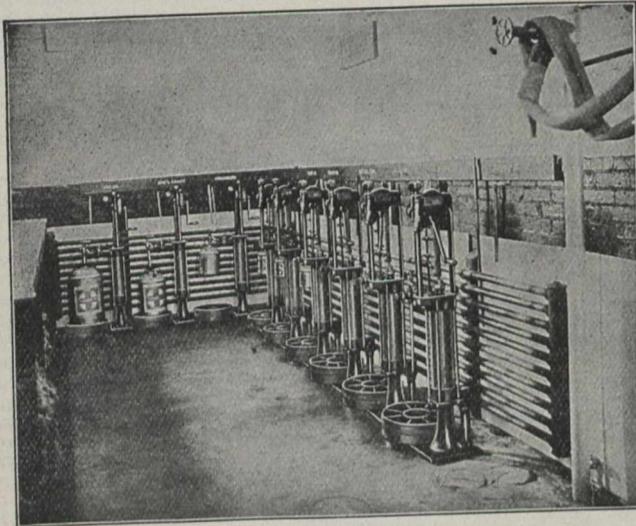
Better and Cheaper than hand made

M'f'd by **J. HARRISON & SONS CO., LIMITED**

OWEN SOUND, ONT.

These plugs are giving good satisfaction. We are also large dealers in Ties, Posts, Timbers, Lumber, Sash, Doors, Interior Finish, and with the plant we have here should be able to supply you.

Our Specialty is Good Material Promptly. Try us once.



Bowser Pumps in a Railway Storehouse

FIRE-PROOF OIL STORAGE

When your oils are stored by the Bowser System, you know they can never be the source of a fire—

What is more, fire starting from some other source cannot get to the oils.

These are only two results of

THE BOWSER SYSTEM

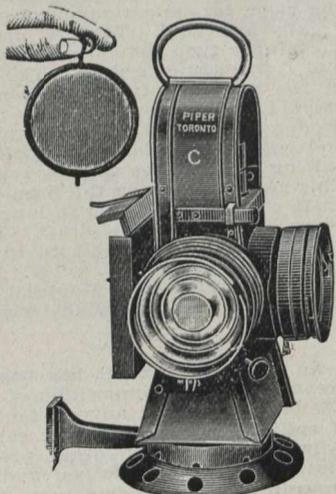
The Bowser is constructed so as to secure the measure of safety prescribed by the National Board of Fire Underwriters.

Equipments for Railway Oil Houses described in Bulletin 18. Send for it.

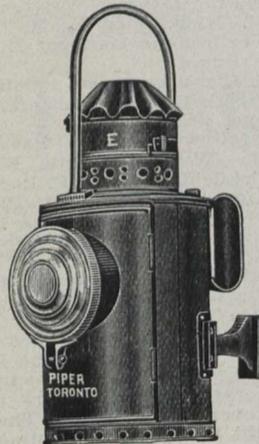
S. F. BOWSER & CO., LIMITED
66-68 FRASER AVENUE - - TORONTO

THE N. L. PIPER RAILWAY SUPPLY CO., LIMITED — TORONTO —

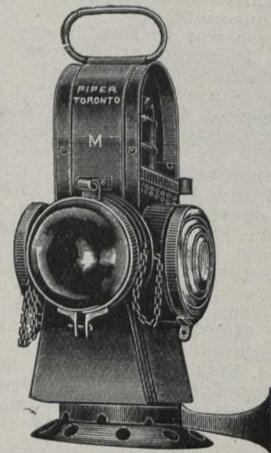
MANUFACTURERS OF



CLASSIFICATION LAMP



ENGINE TRI-COLOR LAMP



MARKER LAMP

RAILWAY LAMPS ETC

Steam Railway Track Laid in 1909.

In accordance with our annual custom, circulars were sent in November to all railway companies in Canada, asking particulars of new track laid during 1909, the circulars being sent out some time earlier than formerly in order to ensure an earlier publication of the figures. The following table has been compiled from returns received to Dec. 20, the mileage given in some cases being estimated, as track-laying had not been completed for the season when the return was made up. The figures show that the total length of new track, exclusive of second track and sidings, laid during the year on the steam railways from which reports have been received was 1,507.02, against 1,505.95 miles in 1908.

ALBERTA RY. AND IRRIGATION Co.	Miles.	Miles.
From Raley to Wolford.....	8.00	
ATLANTIC, QUEBEC AND WESTERN RY.		
From Port Daniel to Grand Pabos	20.00	
From Grand Pabos to Grand River	10.00	
From Gaspe to Douglstown....	6.00	
**CANADIAN NORTHERN ONTARIO RY.		
Hawkesbury to Ottawa	57.08	
Udney to Orillia	2.39	
Parry Sound spur	1.00	
Sellwood Jct. northerly	30.02	
CANADIAN NORTHERN QUEBEC RY.		
Garneau-Quebec cut off, Quebec end	17.10	
St. Jacques to Rawdon	11.00	
CANADIAN NORTHERN RY.		
Maryfield branch, from Maryfield on Brandon-Regina line, westerly	90.00	
Vegreville-Red Deer branch, from main line near Vegreville, southwesterly	20.00	
Goose Lake branch, from mileage 75 west of Saskatoon	55.00	
Rosburn extension, from mileage 115 northwesterly	50.00	
Rapid City line, from Hallboro, Man., westerly	70.00	
St. Rose du Lac branch, Manitoba	15.00	
Dundee branch, Manitoba	5.00	
**CANADIAN PACIFIC RY.		
From mileage 31.6 to Duhamel..	3.14	
From Mowbray to Windygates...	7.00	
From Broomhill to Tilton	8.40	
From Wynyard to Lanigan Jct.	40.70	
From Wilkie to Hardisty	136.60	
From Weyburn to Forward	26.00	
*From Lethbridge to Old Man River	20.40	
||From Hector to Field	8.20	
CENTRAL ONTARIO RY.		
From end of steel, near Marynooth, north	1.00	
DIAMOND RY. COAL Co.		
From Kipp to Diamond City ...	6.00	
ESQUIMALT AND NANAIMO RY.		
From Wellington to Parksville..	18.00	
GRAND TRUNK PACIFIC RY. AND BRANCHES.		
From Itmar to Clover Bar	102.00	
From Edmonton to Wolfe Creek. 122.00		
From Melville to Balcarres	34.00	
From Melville to Yorkton	25.00	
From Tofield to Camrose	26.00	
GREAT NORTHERN RY.		
From Cloverdale to Sumas	2.00	
Burrard Inlet line	1.93	
From Keremeos to Princeton (est.)	42.00	
HA HA BAY RY.		
From Waterside to Jonquieres ..	2.00	
INTERNATIONAL RY. OF N. B.		
From mileage 62 to 85	23.00	
MANITOULIN AND NORTH SHORE RY.		
From mileage 13 west of Sudbury to mileage 14.14	1.14	
NATIONAL TRANSCONTINENTAL RY.		
Moncton westerly	13.00	
Chipman westerly	5.00	
Intercolonial crossing, e. and w. 27.00		
Quebec-N.B. boundary e. and w. 30.00		
Quebec bridge, e. and w.	49.00	
T. & N. O. Jct., e. and w.	44.00	
Ontario and Man. boundary, east	144.00	
NORTHERN NEW BRUNSWICK & SEABOARD RY.		
Between Nipisiquit Jct. and Drummond Mines	4.00	
From Newcastle Jct. to ore dock ..	1.00	
PACIFIC COAST MINES (LTD).		
From Boat Harbor to Fiddicks Jct. QUEBEC CENTRAL RY.		
From St. George to St. Justine..	27.00	
SUPERIOR AND WESTERN ONTARIO RY.		
From Superior Jct. to O'Brien..	8.00	
WINNIPEG CITY POWER PLANT LINE.		

From Lac du Bonnet to Point du Boise	24.00
From Station 1187 to gravel pit ..	1.25
	25.25

*The length of line which the C.P.R. grade revision between Hector and Field supersedes was 4.1 miles, so that the revision adds 4.1 miles to the length of the line.

**On the Canadian Northern Ontario Ry.'s Hawkesbury-Ottawa line 53 miles were laid in 1908 and the balance, 4.08 miles, in 1909. The 53 miles were not included in the figures received from the company a year ago, so the whole mileage is now included in the 1909 returns.

***The figures given of the C.P.R. western lines are subject to revision, as there is a discrepancy in the returns received from two different officials.

||The C.P.R. Lethbridge-Macleod cut-off has a total length of 35.24 miles, and supersedes the original line of 38.66 miles. Track was laid on 14.83 miles in 1908, and on the remaining 20.40 miles in 1909.

The C.P.R. subsidiary lines in the United States laid track as follows:

MINNEAPOLIS, ST. PAUL AND S. S. MARIE RY.	Miles.	Miles.
From Moose Lake to Superior and Duluth	49.20	
From Moose Lake west on extension	45.00	
		94.20
DULUTH, SOUTH SHORE AND ATLANTIC RY.		
Three spur lines to mines	7.10	
MINERAL RANGE RD.		
Three spur lines to mines	2.87	
		104.17

The Great Northern Ry. U.S., constructed extensions of its lines in the U.S. to connect, or with a view to connect with, its Canadian lines, as follows:

	Miles.	Miles.
Blaine, Wash., to International boundary	2.96	
Columbia River to Mansfield, Wash.	60.62	
Nashwana to Grand Rapids, Minn.	20.00	
		83.58

Canadian Northern Ry. Earnings, Etc.

Gross earnings, working expenses, net profits, increases or decreases from 1908-09, from July 1, 1909:

	Earnings.	Expenses.	Net Earnings.	Net Increase or Decrease.
July	\$ 843,500	\$613,900	\$229,600	\$26,700+
Aug.	807,100	602,700	204,400	18,300+
Sept.	1,076,800	765,300	311,500	60,400+
Oct.	1,384,200	903,500	480,700	60,600+
Nov.	1,517,600	970,100	547,500	134,000+
	\$5,629,100	\$3,855,500	\$1,773,600	\$300,800+
Inc.	\$ 921,000	\$ 621,100	\$300,800	.....

Approximate gross earnings for three weeks ended Dec. 21, 1909, \$834,400, against 673,300, for same period 1908.

C.P.R. Earnings, Expenses, Etc.

Gross earnings, working expenses, net profits, increases or decreases over 1908-9, from July 1, 1909:

	Earnings.	Expenses.	Net Profits.	or Decrease-
July	7,140,029.93	4,660,159.20	2,479,870.73	205,297.48+
Aug.	7,426,984.62	4,462,926.75	2,964,057.87	385,159.16+
Sept.	8,323,178.03	4,891,288.86	3,431,889.17	1,317,281.40+
Oct.	9,744,596.87	5,358,299.68	4,386,297.19	1,731,030.48+

\$2,634,789.45 \$19,372,674.49 \$13,262,114.96 \$3,638,768.52+

Inc. \$6,182,309.05 \$2,543,540.53 \$3,638,768.52.....

Approximate gross earnings for Nov., \$918,000, and for 2 weeks ended Dec. 14, \$3,657,000; against \$7,156,000 and \$3,071,000 for same periods 1908.

DULUTH, SOUTH SHORE AND ATLANTIC RY.— Operating revenue for Oct., \$308,233.87; expenses, \$200,500.67; net revenue, \$107,733.20, against \$252,057.12 operating revenue; \$171,419.46 expenses; \$80,637.88 net revenue for Oct., 1908. Aggregate operating revenue for four months ended Oct. 31, \$1,212,410.17; expenses, \$791,793.98; net revenue, \$420,616.19, against \$938,438.30 aggregate operating revenue; \$665,169.34 expenses; \$273,268.96 net operating revenue for same period 1908. Approximate earnings for Nov., \$263,784, and for two weeks ended Dec. 14, 1909, \$101,180, against \$233,059 and \$102,538 for same periods 1908.

MINERAL RANGE RD.— Operating revenue for Oct., \$73,725.1; expenses, \$65,842.15; net revenue, \$7,883.01, against \$77,294.63 operating revenue; \$56,384.97 expenses; \$20,909.66 net revenue for Oct., 1908. Aggregate operating revenue for four months ended Oct. 31, \$298,657.05; expenses, \$248,482.65; net revenue, \$50,174.40, against \$296,176.68 aggregate operating revenue; \$230,252.25 expenses; \$65,924.43 net revenue for same period 1908. Approximate earnings for Nov., \$70,603, and for two weeks ended Dec. 14, 1909, \$30,522, against \$70,021 and \$31,500 for same periods 1908.

Grand Trunk Ry. Earnings, Expenses Etc.

The following figures give the earnings of the G.T.R., the C.A.R., the G.T. Western Ry., and the D.G.H. & M. Ry., separately, for Oct., as compared with Oct., 1908:

GRAND TRUNK RAILWAY.	1909.	1908.
Earnings	\$3,130,000	\$3,012,095
Expenses	2,181,000	2,073,159
Net earnings	\$949,000	\$938,936
CANADA ATLANTIC RAILWAY.		
Earnings	\$203,000	\$153,405
Expenses	149,000	170,937
Net earnings	\$54,000	*\$17,532
GRAND TRUNK WESTERN RY.		
Earnings	\$526,000	\$473,364
Expenses	421,500	356,484
Net earnings	\$104,500	\$116,880
DETROIT, GRAND HAVEN & MILWAUKEE RY.		
Earnings	\$184,700	\$149,996
Expenses	140,200	117,367
Net earnings	\$44,500	\$32,629
*Deficit.		

TRAFFIC RECEIPTS OF THE SYSTEM

Aggregate from July 1, to Nov. 30, 1909:	1909	1908	Inc.	Decr.
Grand Trunk	\$3,043,937	\$2,813,038	\$230,899	.....
Canada Atlantic	193,362	174,748	18,614	.....
G. T. Western	531,609	488,461	43,148	.....
D.G.H. & M.	176,856	154,645	22,211	.....
Total	\$3,945,764	\$3,630,892	\$314,872	.....

No Canadian Car Shortage.

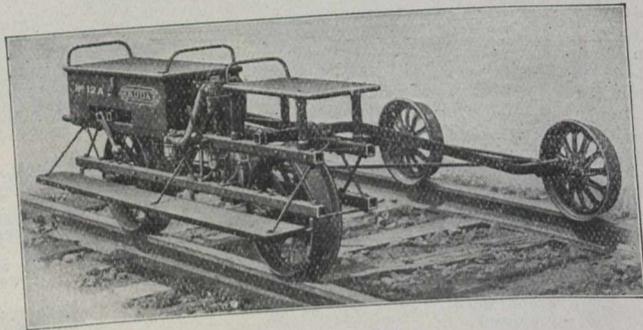
In its December issue Canadian Machinery said:—"There is such a shortage of cars on the Canadian railroads that manufacturers and shippers find it difficult to make deliveries. It has been reported to Canadian Machinery that orders placed early this year have not been delivered through lack of rolling stock."

We think our contemporary has been altogether misinformed, and that there is no foundation for the report that orders for goods placed early in 1909 had not been delivered at the end of the year owing to shortage of cars. In the early part of the year, as undeniable statistics show, there was a considerable surplus supply of cars on nearly all Canadian lines. As business improved and as grain began to move there was of course a greater demand for cars, but certainly there has been no general car shortage, although there may have been a few local cases of shortages of equipment for perishable freight, and the highest authority in Canada on car service advises us that Canadian Machinery's statement is not founded on facts. The movement of freight during October and November was very heavy, probably the heaviest in the history of the country, more cars being reported to the Canadian Car Service Bureau than during any previous two months.

As a matter of fact the railway companies made excellent provision for the increased business which they expected during this fall and winter, and how well they succeeded is shown by the report of the directors of the Grain Growers' Association, presented at a meeting at Brandon, Dec. 15, which was attended by 1,500 delegates. The report said: "We are glad to bear testimony to the very satisfactory service the railways supplied this season for the moving of the crops. In former years we had reason to complain not only of the shortage of cars, but of the distribution of cars, and of obstacles placed in the way of farmers loading their grain direct into cars. This year, notwithstanding there was very large increase in the amount of grain offered for shipment as compared to former years, there was no lack of cars in Manitoba and we heard of no complaints as to the facilities offered farmers for loading their grain direct."

BUDA MOTOR CARS

BUY THE BEST



SALES AGENTS:
DOMINION EQUIPMENT & SUPPLY CO.,
354 Main St., WINNIPEG, MAN.

THE NEW HOTEL BREVOORT CHICAGO



The Twentieth Century Hotel

Absolutely Fireproof

Centrally located. Near-by cars for all Stations. All rooms are outside rooms. Baths Connecting. Restaurant. Grill Room. Buffet. Unsurpassed in Appointments and Decorations. Table Unexcelled. Prices Moderate.

A. D. HANNAH & D. HOGG,
PROPRIETORS

ARTHUR M. GRANT,
MANAGER

YOU will always hear

A GOOD WORD

for the

MARITIME EXPRESS via
INTERCOLONIAL RAILWAY

between

Montreal, Quebec, St. John and Halifax

Table D'Hote Meals are Served

Dinner \$1.00

Breakfast 75c.



Supper 75c.

G. T. R. Subsidiary Companies.

The following are the officers and directors for the current year of various companies subsidiary to the G.T.R.:—

CHICAGO, DETROIT AND CANADA GRAND TRUNK JCT. RD.—President and General Manager, C. M. Hays; Vice-President, E. H. Fitzhugh; other directors, W. H. Biggar, J. W. Loud, A. B. Atwater; Treasurer, F. Scott; Secretary, G. W. Alexander.

DETROIT, GRAND HAVEN AND MILWAUKEE RY.—President and General Manager, C. M. Hays; Vice-President, E. H. Fitzhugh; other directors, W. G. Brownlee, Jos. Hobson, J. W. Loud, A. B. Atwater, F. W. Egan, J. Pridgeon, Jr., A. P. Sherrill; Secretary-Treasurer, G. W. Alexander.

GRAND TRUNK JCT. RY.—President, C. M. Hays; Vice-President, E. H. Fitzhugh; other directors, J. W. Loud, A. B. Atwater, F. A. Howe; Secretary-Treasurer, G. W. Alexander.

GRAND TRUNK WESTERN RY.—President and General Manager, C. M. Hays; Vice-President, E. H. Fitzhugh; other directors, W. G. Brownlee, A. B. Atwater, A. Dixon, L. R. Skinner, A. W. Wright; Secretary-Treasurer, G. W. Alexander.

INTERNATIONAL BRIDGE CO.—President, C. M. Hays; Vice-President, E. H. Fitzhugh; other directors, W. G. Brownlee, H. G. Kelley, J. W. Loud, Jos. Hobson, H. W. Sprague; Treasurer, F. Scott; Secretary, G. W. Alexander.

MICHIGAN AIR LINE RY.—President, C. M. Hays; Vice-President, E. H. Fitzhugh; other directors, W. H. Biggar, J. W. Loud, A. B. Atwater; Treasurer, F. Scott; Secretary, G. W. Alexander.

ST. CLAIR TUNNEL CO.—President, C. M. Hays; Vice-President, E. H. Fitzhugh; other directors, J. W. Loud, Jos. Hobson, W. H. Biggar, W. G. Brownlee, A. B. Atwater; Treasurer, F. Scott; Secretary, G. W. Alexander.

TOLEDO, SAGINAW AND MUSKEGON RY.—President, C. M. Hays; Vice-President, E. H. Fitzhugh; other directors, J. W. Loud, A. B. Atwater, C. W. Middleton, A. F. Temple, F. E. Ranney; Secretary-Treasurer, G. W. Alexander.

Alberta and Great Waterways Ry.

The Alberta and Great Waterways Ry. Co. was incorporated by the Alberta Legislature in 1909, with power to construct and operate a railway from Edmonton to Fort McMurray, and from near the western end of Lac la Biche to the eastern end of the same, with suitable terminals in Edmonton. The Legislature at the same time confirmed an agreement made with the company for the construction of the line and guaranteeing the payment of the principal and interest on the company's bonds to the amount of \$7,400,000, or at the rate of \$20,000 a mile for 350 miles of railway and \$400,000 for the terminals in Edmonton. The security to be taken by the Government is a first mortgage of the line and terminals. The Standard Trust Co., Winnipeg, is trustee for the bonds, which are of the denomination of \$1,000, bearing interest at the rate of 5%, each bond being endorsed with the Government guarantee, as provided by the agreement. An arrangement was made with J. P. Morgan & Co., New York, to place the bonds on the London, Eng., market, through its British house, J. S. Morgan & Co. The issue price was 110%, at which the bonds will yield 4½%, allowing for redemption at par on maturity Jan. 1, 1959. The company, however, reserves the right to redeem any or all of the bonds, at any time after Jan. 1, 1919, upon giving six months notice, at the rate of 112½% or £231 3s. 3d. for each \$1,000 bond. The subscription list was opened Nov. 10, and

closed two days later, the applications received being for an amount considerably in excess of that offered.

W. R. Clarke, President, and E. A. James, General Manager, were in Montreal Dec. 8 arranging for the purchase of rails, etc. for construction. Mr. Clarke stated that the financing had been completed and that contracts for the grading of the whole line, a distance of 350 miles, would be let early in Jan. The contract would call for the completion of 150 miles, which would carry the line as far as Lac la Biche, by the fall, and it was hoped to have a train service in operation over it at that time. The company will do the tracklaying itself, the contract to be let, being for the grading, bridging and structures. Mr. James in an interview, stated that the line will have its northerly terminal at Fort McMurray, 350 miles north-east of Edmonton, and will open out a stretch of country equal to the Edmonton district for farming purposes. At Fort McMurray it will connect with the Peace, Athabaska and Mackenzie Rivers, which together have 3,500 miles of waterway navigable by steamers, stretching to the Arctic Ocean. The road will thus connect the Arctic Ocean by water and rail with the transcontinental railways at Edmonton. As soon as location surveys have been completed, the right-of-way will be cut out on the first 150 miles to Lac la Biche. Ties will be got out this winter.

J. A. L. Waddell, Chief Engineer, while in Winnipeg recently, to secure engineers for surveys on this line, stated that one party was then in the field; that two more would be sent out immediately, and a fourth as soon as engineers could be found. He further stated that construction was commenced Oct. 1, 1909, that 10 miles of grading had been done, and the work would be pushed forward as surveys were completed.

The officials are: President, W. R. Clarke, President, United States Trust Co., Kansas City Mo.; Vice-President, Bertrand Clark, Kansas City, Mo.; General Manager, E. A. James, Edmonton, Alta.; Chief Engineer, J. A. L. Waddell, Kansas City, Mo.

Railway Commissioners' Proposed Orders.

At its sittings on Jan. 18 the Board will consider the making of a general order establishing the places at which inspection of carload freight should be made.

The Board has notified all railway companies under its jurisdiction to appear at its sittings in Ottawa, Jan. 4, to show cause why an order should not be made prohibiting brakemen from riding on the top of freight cars and reducing the height of bridges to 17 ft., or to a height sufficient to permit the highest freight car passing thereunder.

On Jan. 4, at Ottawa, the Board will consider a draft order which has been framed on the complaint of the Winnipeg Jobbers and Shippers Association. It proposes to direct that all railways within six months from the passing of the order provide at all flag stations suitable shelters or waiting rooms for freight and passengers, the shelters to be provided with doors and windows and up to the standard of a specification attached to the order. Platforms and approaches to be also provided. Freight to be delivered to such points to be placed in the shelters. At all stations and shipping places where the average earnings are not less than \$15,000 a year, stations to be erected and permanent agents to be appointed. At points where the business consists principally of grain shipments which amounted to at least 50,000 bushels in the previous year, temporary agents to be employed during

the grain shipping season. Telegraph operators located for the handling of trains to be provided with equipment to enable them to take care of all traffic at their respective points.

Victorian State Railways Report.

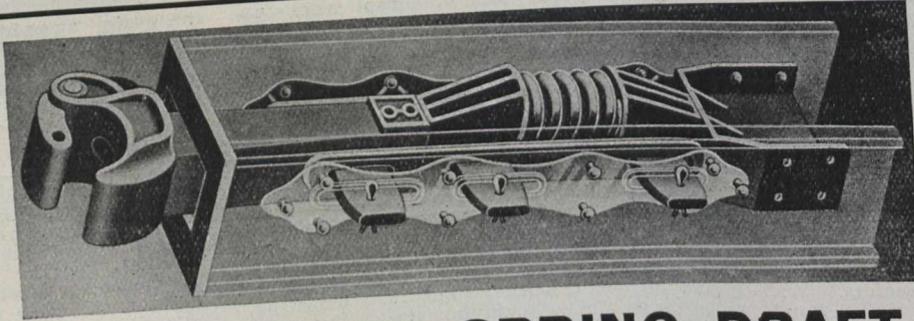
The annual report of the Victorian State Railways, Australia, signed by the Commission of which T. Tait, formerly Manager of Transportation C.P.R., is Chairman, for the year ended June 30, 1909, has been received. The gross revenue for the year was \$20,532,840, and the working expenses (including a special payment of \$340,519, into the railway accident and fire insurance fund) were \$11,725,535; the net revenue from the St. Kilda and Brighton Electric St. Ry. was \$9,081, making a total net revenue of \$8,616,386. The interest charges and expenses were \$6,959,547, and pensions and gratuities \$513,002, which amounts deducted from the total net revenue leave a surplus of \$1,143,837 to be credited to the consolidated revenues of the State.

The special feature of the report is a statement showing the results for the six years operation of the lines to June 30, 1903, compared with the six years to June 30, 1909, during which period the present Commissioners have been in charge. It shows an increase in the gross revenue of \$22,443,685, an increase in the working expenses of \$7,394,866, and an increase in the net revenue of \$15,048,819. Out of net revenue \$3,398,715 has been expended on special objects and charges in liquidation of extraordinary liabilities, against \$787,706 in the preceding six years. The interest charges and expenses (pensions and gratuities being an addition in the year 1908-09 only) show an increase of \$885,226 in the six years. The surplus credited to Consolidated Revenue amounted in the six years to \$3,779,047, while in the six years preceding June 30, 1903, the Consolidated Revenue was called upon for \$7,767,537 to meet deficits. With a decrease of 2,400,758 train miles run, 99,974,678 passengers, 4,053,817 tons of goods and 480,879 tons of live stock have been carried in excess of the traffic in the six years prior to 1903. The percentage of working expenses to gross revenue has decreased from 59.83% to 54.41%.

Quebec Public Utilities Commission.—Sir Lomer Gouin, Premier of Quebec, when in Toronto recently, announced that his Government had decided to appoint a Public Utilities Commission, the members thereof to be appointed for ten years, which would have jurisdiction over power matters and all corporations operating public utilities under provincial franchise. It would have, in addition, powers similar to those exercised by the Ontario Railway and Municipal Board.

C.N.R. Quebec-Ottawa Line.—The Canadian Northern Quebec Ry. announces the establishment of "the only through passenger service between Ottawa and Quebec, also the improvement of its already excellent trains between Montreal and Quebec. Trains leave Ottawa 8.30 p.m. and Montreal 11.45 p.m., arriving in Quebec 7.20 a.m. daily, and leave Quebec at 11 p.m., reaching Montreal at 6.20 a.m. and Ottawa at 9.45 a.m. The opening of the new Quebec-Ottawa line also provides a short route to the Dominion capital through the Eastern Townships and the lower St. Lawrence via Levis.

Representatives of the New Brunswick Government, the Grand Falls Power Co., and of various industries in the province met the National Transcontinental Ry. Commissioners in Ottawa, Dec. 16, and discussed the question of the operation of the line through the forest region in Quebec and New Brunswick by electricity to be generated at Grand Falls, on the St. John River.



THE FARLOW TWIN SPRING DRAFT GEAR

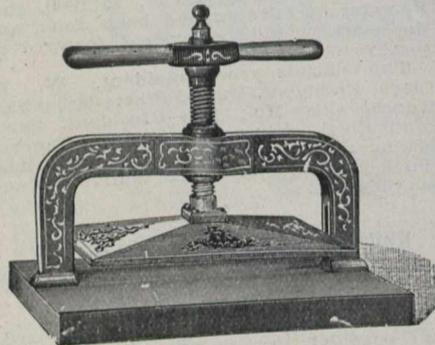
Designed for Wooden or Steel Cars and Engines.
Pulling Strains Distributed Equally on the Three Cross Keys.
Buffing Shocks Distributed on End Sill, Three Cross Keys, Filler Block and Body Bolster. Cannot be Pulled Out or Driven Back and Will Not Spread Sills.

FARLOW DRAFT GEAR CO.
Baltimore, Md. Chicago, Ill.

ESTABLISHED 1854 INCORPORATED 1881
THE JAMES SMART MFG. COMPANY
WORKS LIMITED
BROCKVILLE, ONT. 131 Bannatyne Ave., WINNIPEG, MAN.

HARDWARE AND TOOL
MANUFACTURERS

LETTER PRESSES
FREIGHT TRUCKS
STATION BENCHES
ENVELOPE OPENERS,



HOOK AND SPIKE FILES, WAYBILL COPYING PRESSES, ETC.

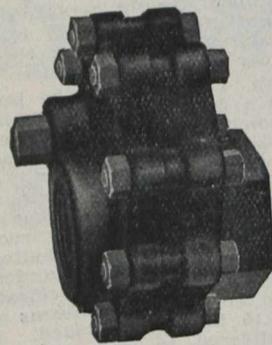


A GUARANTEE OF EXCELLENCE

Purchasing Agents will be furnished with Catalogues promptly on application.

EVERLASTING BLOW-OFF VALVE

EASILY OPERATED
STRAIGHT THROUGH BLOW
SELF CLEANING



NO STUFFING BOX
NO REPAIRING
SELF GRINDING SEATS

Send for descriptive booklet and prices

SCULLY STEEL & IRON CO. DEPT. 22 CHICAGO, ILL.

ELECTRIC RAILWAYS

Canadian Street Railway Association.

PRESIDENT, D. McDonald, Manager, Montreal St. Ry.; VICE-PRESIDENT, J. Anderson, Manager, Sandwich, Windsor and Amherstburg Ry.; SECRETARY-TREASURER, Acton Burrows, Managing Director, Railway and Marine World.

ASSOCIATION'S OFFICE, 157 Bay St., Toronto.

EXECUTIVE COMMITTEE:—P. Dubée, Secretary, Montreal St. Ry.; E. A. Evans, General Manager, Quebec Ry. Light and Power Co.; R. J. Fleming, General Manager, Toronto Ry.; H. M. Hopper, Secretary-Treasurer, St. John Ry.; J. E. Hutcheson, Superintendent and Purchasing Agent, Ottawa Electric Ry.; C. B. King, Manager, London St. Ry.

OFFICIAL ORGAN, THE RAILWAY AND MARINE WORLD.

ASSISTANT SECRETARY, Aubrey Acton Burrows, Secretary and Business Manager, Railway and Marine World.

The Winnipeg Electric Ry. Co.'s Power Plant Accident.

The recent accident at the Lac du Bonnet water power plant which is situated on the Winnipeg River about 64 miles from Winnipeg, was remarkable for two features; first, the rapidity with which normal conditions were restored in the face of the damage done, and secondly, as showing the extreme dependence of modern cities upon electrical current not only for mechanical and manufacturing energy, but for all the ordinary comforts of civilized life. On the evening of Nov. 23, the bursting of no. 7 penstock, just as the load was reaching its peak for lighting and extra car service during the rush hours, resulted in a tie up of the system and considerable damage to the apparatus. At about 4.38 p.m. everything was running smoothly as usual, no accident tying up the plant having occurred since it was started in Aug., 1906. The generating station was under a load of about 12,700 kilowatts. No. 7 unit had been put in service at 4.32 p.m., parallel with the other eight units in the plant, and was carrying a load of about 1,500 kilowatts. The switchboard operator had called for more gate on no. 7 as the evening load was coming on. When the load on this unit had reached about 2,000 kilowatts, or about seven-eighths full gate, the penstock burst on the south side, two plates giving way, 12 ft. in length, and opening up about 9 ft. high. The cradle or bed casting of the draft chest on the down stream set of turbines cracked the entire distance through the line of rivet holes where these penstock plates were attached.

The volume of water which immediately issued from this great opening burst in the door and made a huge breach through the wall of the building between wheel units 7 and 8, and flowed directly on to no. 8 generator, filling that end of the generator room above the doors to a depth of about 8 to 10 ft. The force of the water was tremendous, and it spread, flooding the entire building and reaching a depth of from 2 to 4 ft. in the most distant parts of it. The men at the gates of no. 7 at the time of the occurrence had barely time to escape with their lives, one of them in fact being swept out the door at the north end of the building by the rush of water. Very much credit is due to the employes for their foresight and promptness in throwing the current off the machines instantly and preventing the entire destruction of the whole of the machinery in the building. The rush of water was so great that it was impossible for the employes to reach the governor hand wheels to close down the turbines by way of the floor, but they were lowered down by ropes from the windows from the wheelhouse roof and in about 4 or 5 ft. of water managed to stop all wheels except units 8 and 9, which could not be reached owing to the tremendous volume of water which rushed through and completely over

them. These two machines were running under water for a couple of days. A staff of men under Superintendent J. Smeaton immediately undertook to lower the headgates, but the flow of water through the burst penstock made such a pressure against the gates that in spite of cranks, props and pries, the gates refused to budge.

Meanwhile at headquarters in Winnipeg the first intimation of trouble was the loss of juice. Cars were just filling up for the evening rush and were left stranded on the street, some of the passengers patiently sitting for over an hour waiting for them to move. All lights and power were, of course, off, and, at first, the general public were under the impression that there had been a serious fire, as a few weeks earlier, a fire near the principal sub-station had caused the firemen to cut the wires and temporarily inconvenience a large portion of the city. For some time Manager Wilford Phillips was as much in the dark as anyone else as to the cause of the trouble. The company has a private telephone to Lac du Bonnet, but owing to everyone of the staff being rushed to the head gates to try and stop the flow of water there was no one left to answer the telephone. As soon as it was realized that the interruption of the service was more than trifling the Manager issued instructions to have the old steam plant, used to generate power before the Lac du Bonnet was built, put into commission at once. Three years previously this plant had worked up to an overload of 8,000 h.p., but although the precaution had been taken of keeping up steam sufficient to turn the wheels over once a day, things there were naturally not in condition to get back to former efficiency, and in any case the power at full capacity was far below the present requirements of Winnipeg. The best that could be done that night was to furnish a partial lighting service, and in the early hours of the morning to take in the cars.

Two hours after the news of the serious nature of the accident reached him, Manager Phillips with C. R. Ross, and D. Ross, the company's Chief Electrician and Civil Engineer, was on his way to the scene of the disaster in a special train. The condition of affairs on arrival late that night (nine miles having to be driven from the station over a corduroy road) was found to be most serious, the attempts to shut off the water having entirely failed. The only means which could be devised for stopping it was driving piles in front of the headgates, and sheeting these in front with brush and canvas and bags of sand, by which means the water was eventually checked sufficiently to enable the headgates to be lowered. The water was closed out of the power house sufficiently by the evening of Nov. 26 to allow examination of the machinery, and work was at once started to get some of the generators again in operation. On the evening of Nov. 29, less than six days after the accident, one generator was sufficiently dried out so that with temporary wiring which was arranged, about 1,500 kilowatts of power was supplied to Winnipeg to assist the overburdened steam plant where one or two minor accidents had been caused by the extraordinary strain on boilers, engines, and generators alike.

The system following in the city was to furnish as full a car service as possible from 6 to 8.30 a.m., and a light service on as many circuits as possible. From 8.30 a.m. to 4.30 p.m., the available juice was placed at the disposition of users of commercial power. From 4.30 to 7.30 p.m., cars and light; from 7 p.m. to midnight a full lighting service, and from midnight to 5 a.m., commercial power. This system was adopted at the request of the Board of Trade and City Council, as it was represented that this

would allow the factories to run on practically full time. The public generally took the accident most good humoredly and appeared to realize that the Company was doing its best under the circumstances, but one of the newspapers which had a supposed mechanical expert on its staff created some amusement by a violent tirade against the company with regard to the steam plant, the capacity of which the reporter judged in true expert fashion by the rating on the name plates on the machines that he saw.

At Lac du Bonnet, Manager Phillips stayed with the work of repairs. All the cables in the building, from the generators and switchboard to the transformers and the switch cells, being in ducts below the floor, were found to be entirely soaked with water, and temporary wiring had to be installed to get the generators into operation after they had been dried. Operations were also hampered by the force of the water having broken the steam connections and done other damage of this character. In inspecting and testing the generators it was found that the most serious damage was near the point where the break occurred. Those farthest away were the least damaged. One generator had to be partially rewound on one side where it took the full force of the water and tore up the insulation. So far as the public was concerned, with a three-quarters car service and a full lighting and power service within a week of the accident, by the steam plant helped out from two generators at Lac du Bonnet, the accident was all over, but the staff still had a very anxious time for another five or six days, and it was not until a fortnight after the trouble occurred that Manager Phillips thought it wise to return to Winnipeg. Great credit is due to everyone concerned for the remarkable recovery which they affected under very adverse conditions in an isolated district where everything had to be brought in by special train. Particular credit is due to J. H. Smeaton, superintendent of the plant, and C. R. Ross, Chief Electrician, for the ability they showed and the rapidity with which they got the plant into operation considering that the cables on the floor were soaked with water and lying under water for three or four days. One generator was started delivering power to Winnipeg on the sixth day after the accident, two inside of a week, and after that the progress was at the rate of one a day. Both from experts and business men, the Manager, Mr. Phillips, has received deservedly high praise for the energy and perseverance he showed in the emergency, and the Winnipeg Electric Ry. Co. is to congratulate on the efficiency of its staff in coping with such an emergency. The company spared neither expense nor trouble to meet the demands of the situation, and to anyone who saw the damage immediately after the break it is hard to understand how everything was practically restored in a fortnight.

The Lac du Bonnet plant has a somewhat unique record, as with this single exception its previous record was that there had been only a total shut down of 25 minutes duration in the three years since it commenced operations, which it is believed cannot be beaten by any other water plant.

As to the cause of the accident, on examination of the gate rigging of no. 7 turbine, it was found that five teeth had been stripped from the hand wheel pinion on the governor, and in the opinion of experts when these teeth stripped the turbine gates were allowed to close very suddenly, and this caused the bursting of the penstock. Mention should be made of the work of Wilson Phillips, brother of the Manager, who was in charge of the Winnipeg end of the works during the crisis. Some assistance was given him by the city's steam plant, but

RENOUF Publishing Co.

61 Union Avenue

Montreal

JACOBY—Structural Details of Elements of Design in Heavy Framing. 8vo, ix+368 pages. Profusely illustrated; figures in the text, 6 folding plates and 34 full page illustrations. Cloth. \$2.25 net.

MOLITOR—BEARD—Manual for Resident Engineers, Containing General Information on Construction. 16mo, iv+118 pages. Cloth, \$1.00.

SEARLES—Field Engineering. 16mo, xiv+503 pages, 108 figures. Morocco, \$3.00.

SEARLES—The Railroad Spiral. 16mo, x+127 pages, illustrated. Morocco, \$1.50.

NAGLE—Field Manual for Railroad Engineers. 16mo, xv+403 pages, 99 figures. Morocco, \$3.00.

ORROCK—Railroad Structures and Estimates. 8vo, vi+410 pages, 93 figures. Cloth, \$3.00 net.

TURNEAURE—MAURER—Principles of Reinforced Concrete Construction. 8vo, x+429+317 pages, 17 plates, and 164 figures. Cloth, \$3.50.

WADDELL—De Pontibus. A Pocket Book for Bridge Engineers. 16mo, xii+493 pages, 10 folding plates. Morocco, \$2.00.



Style No. 17

Style No. 20

Ask for Information about Six Other Styles.

The Improved
RAMAPO
Automatic, Safety
SWITCH STANDS
have no equal.

Canadian Ramapo Iron Works
LIMITED
Manufacturers
Niagara Falls, Ont

AGENCIES:

Dominion Equipment &
Supply Co.,
354 Main St. Winnipeg

C. L. Hackett.
605 Eastern Townships
Bank, Montreal

New Ways To The Woods

The six railways of the Canadian Northern Railway system offer the widest choice of new territories for the fisherman, canoeist, camper and hunter.

IN NOVA SCOTIA the Halifax and Southwestern Railway, from Halifax to Yarmouth, serves seven hundred miles of ocean shore; two score generous trout streams and the famous Rossignol lake system.

IN CAPE BRETON, sixty miles of the Gulf of St. Lawrence shore is skirted by the Inverness Railway, which gives easy access to the Margaree valley—far-famed for its salmon fishing.

IN QUEBEC, the Canadian Northern, Quebec and Quebec, and Lake St. John Railways give easy access to the Saguenay, Upper St. Maurice, the Batiscan, the La Tuque game and fish preserve, and the valleys of the St. Lawrence and Ottawa. All good fishing waters, abounding with ouaniche, trout and bass.

IN ONTARIO, the entire range of the Muskokas, the Georgian Bay hinterland, the French, Pickerel, Still and Maganetawan rivers—well stocked with bass, mascalonge, and pickerel, are best reached by the Canadian Northern Ontario Railway.

IN WESTERN ONTARIO and the prairie provinces, the Canadian Northern Railway serves over three thousand miles of splendid territory. The Rainy River section follows the old Dawson fur trail, which is the finest canoe trip on the continent. There is an amplitude of sporting opportunities for the camera hunter, the fisherman and canoeist. For literature and general or special information inquire of the information Bureau, Canadian Northern Railway System, Toronto.

added to the other anxieties of the acting Manager, was the fact that on several occasions this assistance failed, necessitating the Company's plant being called upon to carry the entire load. The whole circumstances connected with the emergency reflect great credit on all concerned.

Projects, Construction, Betterments, Etc.

The Berlin and Waterloo St. Ry. has under consideration a proposal to construct an extension of its line in Berlin, Ont., from Albert St. to Water St., 7,400 ft. (Oct., 1909, pg. 769.)

Brandon, Man.—Application has been made to the City Council by E. J. Gifford and H. J. Skynner for a franchise for an electric street railway and a power, light and heating plant in the city. (Sept., 1909, pg. 683.)

British Columbia Electric Ry.—General Manager Sperling on his return to Vancouver, B.C., from England, Dec. 7, stated that the directors had authorized expenditures on the company's various projects to the amount of \$6,000,000. One of the large new works to be undertaken will be the erection of a 10,000 h.p. steam auxiliary plant in Vancouver.

The company has agreed with the New Westminster City Council to construct a second track on Columbus St. as far as the Boulevard.

The new line between New Westminster and Cloverdale was put in operation Dec. 20. A gang of men went to work Dec. 7 laying tracks on Eighth St. for the switching of cars from the Vancouver-New Westminster line to the Cloverdale line.

A proposal is under consideration for the construction of a new line from Vancouver through Mission City as far east as Hatzic following the Dewdney trunk road. The line would be about 10 miles long. (Dec., 1909, pg. 929.)

Calgary, Alta.—A bylaw has been approved by the taxpayers authorizing an expenditure of \$40,000 for the improvement of the municipally owned street railway. Plans for the extension of the line are being prepared by the City Engineer. They involve the extension of the existing lines to some of the residential sub-divisions. (Sept., 1909, pg. 683.)

Calgary Southwesterly.—Application is being made to the Dominion Parliament to incorporate a company to construct a railway from Calgary southwesterly to Sheep Creek, thence southerly to connect with the railway running through Crow's Nest Pass; to erect telegraph and telephone lines, and to utilize water and steam power for generating electricity. W. L. Walsh, Calgary, Alta., is solicitor for applicants.

Chatham, Wallaceburg and Lake Erie Ry.—During 1909 the company laid four miles of new track, from Plain Court Jct. to Plain Court, Ont. It has under survey an extension of six miles from Cedar Springs to Blenheim. (Dec., 1909, pg. 929.)

Cornwall Electric St. Ry.—An agreement has been signed between the company and the Cornwall township council under which the company receives a franchise to extend its line up the West Front road, over Wood's Hill to the Ottawa and New York Ry. station.

Edmonton Radial Ry.—The city council, owning the E.R.R., laid track on 5.17 miles of its streets during 1909, distributed as follows:—from Alberta Ave. to packing plant, 2.52 miles; from Ninth St. and Jasper Ave. to 21st St., 0.50 mile; from First St. to Eighth St. and Vermillion Ave., one mile; from Syndicate St. to Namayo and Jasper Ave., 1.15 miles. No further construction is contemplated at present. (Oct., 1909, pg. 769.)

Grand Valley Ry.—With a view of improving the line between Brantford and

Paris, Ont., the company proposes to do away with its present track at the entrance to the town, where there is a steep hill, and locate it some distance westerly and along the G.T.R. This alteration will effect a saving of about a mile in distance. It is also proposed to erect a new and commodious station in Paris, on the site of the present building. With reference to the projected line from Brantford to Port Dover, the Manager stated Dec. 8 that the company intended to start construction in the spring and to have the line completed by the fall. (Dec., 1909, pg. 929.)

The Guelph Radial Ry., which is owned by the City of Guelph, has been directed by the Ontario Railway and Municipal Board to construct a steel bridge over the Speed River, on the Dundas Road. The work will be done during the winter if the necessary steel can be obtained. (Nov., 1909, pg. 847.)

The Hull Electric Co. laid 2.25 miles of new track during 1909, between Laurier Ave. and Main St. (Dec., 1909, pg. 929.)

The International Transit Co. during 1909 laid new track from Upton Road to Pine St., Sault Ste. Marie, Ont., bringing its total to 4.01 miles.

The Kingston, Portsmouth and Cataract Ry. ceased running its cars in the city Nov. 23, following a resolution of the City Council not to enter into a contract for the supply of power for longer than three years, except it had power to cancel the agreement on giving six months' notice in the fourth and fifth year. On the following day the company commenced to take up the tracks at the car barn, with the result that negotiations as to power were resumed. An agreement was finally arrived at on the basis of the city's terms, the new clause providing that the company will pay \$500 interest and depreciation if two new boilers are needed in the power house. The car service was renewed Nov. 27. (Dec., 1909, pg. 929.)

Lake Erie to Owen Sound.—A proposition has been laid before the Brantford, Ont., city council for the construction of an electric railway to Lake Erie points and Owen Sound. J. S. Clark, who is interested in the scheme, addressed the council recently, but owing to remarks in his address concerning another railway the matter was adjourned to Dec. 28.

Lethbridge, Alta.—A proposition has been submitted to the city council by the Lethbridge Radial Ry., for a franchise giving it an entrance into the city for its lines. The points to be connected up are Diamond City, Raymond and the Royal Collieries. The company submitted its proposition in the form of a bylaw, among the provisions of which was one under which the council could acquire the lines at cost, less depreciation, at the end of the term. At a meeting of ratepayers, Nov. 27, the bylaw came up for discussion. The general feeling was in favor of the construction of a line in the city by the council, but it was stated that such a line would not pay unless there were radial lines connected with it, which the city could not construct. No decision was reached, but it was decided to hold another meeting to consider the question. (Dec., 1909, pg. 929.)

London and Lake Erie Ry. and Transportation Co.—The bill to incorporate a company with this title for the purpose of taking over the rights of the South Western Traction Co. and extending its lines, has been under consideration by the St. Thomas City Council. The company is asking power to construct its lines through the city of St. Thomas, and to sell or lease electric power, etc. The council decided to oppose the bill, with the object of having clauses inserted protecting the city's rights, as the owner of a street railway line and an electric power plant. (Dec., 1909, pg. 931.)

London and Lake Erie Ry. and Transportation Co.—The transfer of the South Western Traction Co.'s property in accordance with the terms of the recent purchase was completed Dec. 15. It is stated that \$150,000 will be spent during the year in correcting grades, improving curves and purchasing additional rolling stock. The following committee of directors has been appointed to manage the line: M. A. Verner, Brantford; W. S. Dinnick, W. K. George, G. B. Wood, S. C. Smoke, Toronto; T. H. Purdom and J. Milne, London, Ont. It is not intended to make any immediate change in the staff, S. H. Mower being retained as Manager. (Dec., 1909, pg. 931.)

Moncton Electric Ry., Heat and Power Co., Moncton Electric Tramway.—At a meeting of the directors, Dec. 2, Dr. Henderson of the New Brunswick Oilfields Co. took up the option he secured a short time previously on the charter for a street railway. The price paid for the charter is said to have been \$10,000. It is said that Dr. Henderson is acting for a British company. He left Moncton Dec. 4 for England, and it is said that he will arrange for starting construction in the spring. (Oct., 1909, pg. 769.)

Montreal and Southern Counties Ry.—Five miles of track have been laid to date upon this railway, which mileage is now being operated. Of this 3.5 miles represents the line from Montreal to and over the Victoria Jubilee Bridge to the St. Lambert boundary, and the remaining 1.5 miles the distance from St. Lambert to Montreal South. The company has under construction an extension from St. Lambert to Longueuil, four miles. The contractors for the extension are Bremner and Carriere, Montreal.

The company received notification Dec. 7 that the Lieut.-Governor had signed the bylaw recently passed by Montreal South giving permission for the line to be constructed through that municipality. The work has already been done and cars are being operated.

Application is being made to the Dominion Parliament to extend the time for the completion of the lines authorized by chap. 56 of the statutes of 1897 and acts amending same. (Dec., 1909, pg. 931.)

Montreal Central Terminal Co.—Application is being made to the Dominion Parliament for an extension of time for the construction of the authorized works, and to authorize agreements or amalgamation with other railway, light, heat, power, telegraph and telephone companies, and with municipalities.

The Montreal Park and Island Ry. added 5.33 miles of new tracks during 1909, distributed as follows:—from Henderson's to St. Vincent de Paul, 2.55 miles; on St. Denis, 1.39 miles; on Pie IX., 0.43 mile; and in Cote la Visitation, 0.96 mile. (Dec., 1908, pg. 891.)

The Montreal St. Ry. during 1909 laid 1.60 miles of new track in short lengths on different streets.

The company has been directed to contribute \$15,000 towards the construction of a subway under the C.P.R. at St. Lawrence Boulevard, St. Louis de Mile End.

Press reports stated recently that plans had been completed for the construction of shops in the northern part of the city at a cost of \$1,000,000, the buildings to consist of car-building, machine, electrical and winding, blacksmith and paint shops, and a large building for stores and material. These reports have not been confirmed. (May, 1909, pg. 367.)

The Nelson Street Ry. Co. was incorporated Sept. 9, 1909, with an authorized capital of \$50,000 to carry on a street railway, light and power business in Nelson, B.C. It has secured running powers over the line formerly in existence but which has not been operated for over a year. The line is about two miles long, and it is proposed to extend it about a

NOTICE

To Men Interested in
Boiler Manufacturing,
Bridge Building,
 all kinds of
Structural Steel Work

You are not getting value received for the money expended on construction unless you have

**IMPERIAL
 RIVETERS
 CHIPPERS
 MOTOR HOISTS
 and
 RADIAL DRILLS**

in your tool equipment. As a proof of this statement we give below comparison submitted to us by one of the many users of IMPERIAL RIVETERS showing comparative cost of riveting by hand and with this little money saver.

COMPARISON

With one riveter two men and one heater will drive 500 rivets per day (10 hours), while by hand three men and one heater average about 200.

WITH RIVETER	
Cost, compressed air (Inc. oil) per day.....	.15
2 men @ \$2.50.....	5.00
1 man @ \$2.25.....	2.25
Total.....	\$8.40
BY HAND	
2 men @ \$2.50.....	\$5.00
2 men @ \$2.25.....	4.50
Total.....	\$9.50
Cost per rivet by hand ....	.0380
Cost per rivet with riveter. ....	.0168
Saving per rivet .....	.0212
Saving over 55%.	

Made in Canada by the
Canadian RAND Co., Limited
 MONTREAL, QUE.
 Sales Offices:
 Montreal, Toronto, Rossland,
 Cobalt, Halifax

THE WILLSON PORTABLE FLARE LIGHT

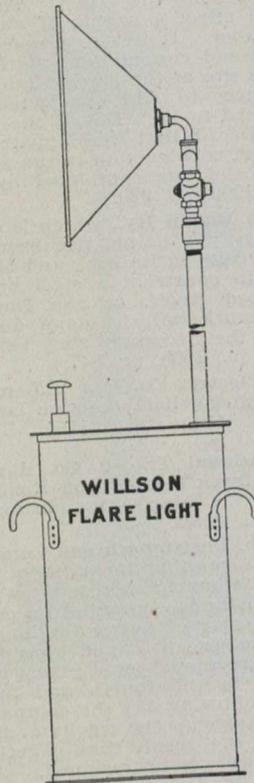
Brilliant Powerful Economical

Specially adapted for use in all kinds of construction work.

Its candle power varies from 1,000—8,000 according to the size of apparatus. The cost of 8,000 candle power is less than 6c. per hour.

O'Brien & Fowler, Contractors to the G.T.P., say:—

“During the past two or three years we have used various kinds of lights, but none of them have proved the equal of yours, either in the matter of economy or usefulness. The effectiveness of your light is beyond dispute.”



Manufactured by

International Marine Signal Co.,

Limited

Ottawa

Write for Catalogue and Prices

TRAINING FOR PROMOTION

The most practical way for ambitious employes to secure promotion is through the Courses of Training of the International Correspondence Schools, of Scranton, Pa. These Schools have special contracts with over 200 American railroad companies for the instruction of their employes. The I. C. S. Railway Courses cost in their preparation over \$35,000. These Courses have been written by the best experts in the country and are edited after a man-ner that 18 years' experience in training ambitious men for promotion has proved to be the most practical and efficient. The I. C. S. own seven special instruction cars which travel over different railroads for the purpose of assisting in the instruction of the I. C. S. student-employes. The Railway Courses contain over 1,200 pages and over 600 illustrations. The following subjects are included:

Air-Brake Pumps, Triple Valves and Brake Valves, Air-Brake Troubles, Operating and Testing Trains, Foundation Brake Gear, Air-Signaling System, High-Speed Brake, Locomotive Boilers, Boiler Attachments, Heat and Steam, The Locomotive, Valves and Valve Gears, Locomotive Management, Break-downs, Train Rules, Vauclain Compound Locomotives, Cross-Compound Locomotives, Tandem and Balanced Compound Locomotives, New York Air-Brake Pumps, New York Triple Valves and Brake Valves, New York Air-Brake Troubles, Train Operation, New York Foundation Brake Gear, New York Air-Signal and High-Speed Brakes, Car Lighting, Car Heating, Electric Head-light, Arithmetic, Westinghouse Air-Brake.

No other school has the equipment or Courses anywhere equal to the I.C.S. If you really wish to secure promotion make some definite attempt to get it. It puts you under no obligation to use the coupon. The advice and information it brings are free. **MAKE A START NOW.**

International Correspondence Schools,
 Box 1072, Scranton, Pa.

Please explain, without further obligation on my part, how I can qualify for a larger salary and advancement to the position before which is marked X

General Foreman	R.R. Con. Engineer
R.R. Shop Foreman	Civil Engineer
R.R. Trav. Engineer	Bridge Engineer
R.R. Trav. Fireman	Chemist
Locomotive Engineer	Mining Engineer
Air-Brake Instructor	Architect
Air-Brake Inspector	Bookkeeper
Air-Brake Repairman	Stenographer
Mechanical Engineer	Ad Writer
Mechanical Drafts.	French } With
Machine Designer	Spanish } Edison's
Electrical Engineer	German } Phonograph

Name

St. and No.

Employed by.....

City..... Prov.

mile and a half. The company is to raise \$25,000 by common stock, and \$25,000 by 6% bonds, which are to be guaranteed by the city, in return for which the city will hold a mortgage on the line and all the company's property. A bylaw confirming the agreement has not yet been submitted to the taxpayers. The directors are:—G. W. McBride, W. G. McMorris, W. Waldie, J. E. Taylor, H. Selous, A. Jeffs, W. P. Tierney, R. A. Brown, A. S. Horswell, H. Wright, and E. B. McDermid, the Secretary-Treasurer. (Dec., 1909, pg. 931.)

Niagara Falls to Dunnville, Etc.—Application is being made to the Ontario Legislature to incorporate a company to construct an electric railway from Niagara Falls, through Stamford, Thorold, and Crowland tps., Welland, Humberstone, Wainfleet, Moncton and Sherbrooke tps., to Dunnville, and a branch from the main line through Wainfleet and Pelham tps. to Fenwick village, and through Pelham and Thorold tps. to the main line at Thorold; to manufacture electric power; to erect telegraph and telephone lines, etc. H. A. Rose, Welland, Ont., is solicitor for applicants.

The Niagara, St. Catharines and Toronto Ry.'s new line between Welland and Port Colborne, Ont., is expected to be completed early in the year. The steel rails were received from Sault Ste. Marie, Dec. 17. Surveys are being made for an extension to Fort Erie. The company has changed the schedule on the run between Falls View and Montrose, the cars being now run every hour instead of every 20 minutes as formerly. In consequence of this the Stamford township council has informed the company that unless it restores the former service the tracks must be taken up. (Dec., 1909, pg. 931.)

Ottawa and St. Lawrence Ry.—We are advised that J. McFarlane, referred to in our last issue as being a director of this company promoting the construction of an electric railway from Ottawa to Morrisburg, Ont., is not connected with the O. and St. L. Ry., but with another company. The O. and St. L. Ry. has a charter for the construction of a belt line of railway from Ottawa to the St. Lawrence River through Morrisburg and back to Ottawa, a total distance of about 255 miles. Surveys have been made for about 45 miles from Ottawa South to Arnprior, but no surveys have been made between Ottawa and the St. Lawrence. It is this company for which it is said that the capital has been subscribed in London, England. (Dec., 1909, pg. 931.)

Ottawa, Rideau Valley and Brockville Ry.—Application is being made to the Dominion Parliament to incorporate a company with this title with power to construct a railway, to be operated by electricity or other motive power, from Ottawa to Brockville; to operate a steam ferry across the St. Lawrence River to Morristown, N.Y.; and a branch line or extension of the railway from Ottawa to High Falls, Que. The promoters are also asking authority to generate electrical power and to distribute the same. The bill declares the works authorized to be for the general advantage of Canada. D. H. McLean, Ottawa, is solicitor for the applicants. (See, also Ottawa, Brockville and St. Lawrence Ry., Nov., pg. 829.)

People's Ry.—The Stratford, Ont., City Council decided Dec. 6 to defer the further consideration of the proposed bylaw to aid in the construction of this projected electric railway by taking preferred stock to the amount of \$90,000. A resolution was passed by the Waterloo, Ont., Board of Trade, Nov. 30, favoring the granting of concessions and financial assistance to the company for an extension of the line from Baden to Waterloo. (Dec., 1909, pg. 931.)

Port Arthur and Fort William Electric

Ry.—The commission having charge of this railway laid 2.5 miles of new track during 1909. One mile was laid in Port Arthur, from Cumberland St. to Dawson Ave., and 1.5 miles in Fort William, being the West Fort loop to the Canada Iron Corporation's works. The commissioners have under consideration the construction of an extension from West Fort to the G.T.P.R. terminals. (Dec., 1909, pg. 931.)

Quebec and Saguenay Ry.—Instructions are said to have been given for the revision of the plans for the construction of the projected electric railway from St. Joachim, the terminus of the Quebec Ry. Light, Heat and Power Company's line to Murray Bay. The work will be done by E. A. Evans, General Manager and Chief Engineer of the Q.R.L. and P. Co. The route of the proposed line, for the greater part of its course, is along the bank of the St. Lawrence, and as this is steep and mountainous rock, the ledge for the railway track is to be made on the side of the mountains by blasting off the rock, instead of by tunnelling, if it is found that the ice in winter will not interfere with such a track. For the purpose of ascertaining this, cribwork will be erected in certain localities, upon which the action of the ice can be tested. It is said that the work of constructing the permanent line will be started in the spring. (Sept., 1909, pg. 683.)

The St. John Ry. has under consideration the construction of an extension from the north end of St. John, N.B., to Milledgeville, three miles. In conjunction with the Dominion Engineer, W. Z. Earle, Manager, made an inspection of the suspension bridge, Nov. 24, on which it is desired to lay tracks. It is stated that they found the bridge in rather bad shape, and that considerable repairs will have to be made on it before tracks can be laid. (Sept., 1908, pg. 665.)

St. Thomas Street Ry.—The St. Thomas, Ont., City Council passed a bylaw Dec. 7 asking the taxpayers to vote, at the municipal elections, \$25,000 for the improvement of the street railway. Of this it is proposed to spend \$12,000 on extensions and improvements. (Dec., 1909, pg. 931.)

The Sarnia St. Ry. during 1909 laid a second track on Front St., and constructed an extension of 1,800 ft. from George St. to Wellington St. (June, 1908, pg. 431.)

Sherbrooke Street Ry.—The city council of Sherbrooke, Que., is considering a proposition for granting a new franchise to a new company. The proposition was submitted by B. W. Hibbard, representing a company which is being formed to take over the rights and franchises of the present company, to improve the existing lines and to extend the line to Magog, Bromptonville and Windsor Mills. The new lines in the city would have a length of from eight to 10 miles. A franchise extending over 60 years was asked, the company to be free from taxation for 30 years. The council offered to sell to the proposed company its right over the Westbury power for \$22,200. The matter is still under consideration.

Toronto Eastern Ry.—The names of the applicants to the Dominion Parliament for a charter of incorporation with this title to construct an electric railway from Port Hope to Toronto are:—T. E. Kaiser, W. F. Cowan, R. McLaughlin, Oshawa; C. H. Downey, Whitby; R. R. Mowbray, Kinsale. The Toronto City Council has decided to oppose the bill. (Nov., 1909, pg. 831.)

Toronto Tube Railway Plans.—In connection with the plans for the construction of a system of tube railways in Toronto a proposal was made to the City Council Nov. 29 to construct and maintain subway and radial lines according to the plans accompanying the report of the special committee of the council

which investigated the matter. The term of the franchise would not be for longer than the term of the franchise of the Toronto Ry. Co. At the expiration of that company's franchise the city would have the option of taking over the property of the tube company at the actual cost with a percentage to the contractors. If the city did not take over the lines the undertaking would be continued by the company. (Dec., 1909, pg. 929.)

The Winnipeg Electric Ry. during 1909 laid 4.037 miles of track as follows:—Dufferin Ave., 13,672 ft.; Academy Road, 2,452 ft.; Osborne St., 1,600 ft.; Marion St., 2,778 ft.; Notre Dame Ave. West, 818 ft.; all double tracks. (Dec., 1909,

Air Brakes for Electric Cars

On Nov. 25 the Board of Railway Commissioners' Secretary notified companies under the Board's jurisdiction that the Board would on Dec. 7 consider the question of air brake equipment on the Hamilton & Brantford Ry. and the Hamilton Radial Electric Ry. and also a proposed order requiring all electric railways subject to the Board's jurisdiction to equip their cars with automatic air brakes as well as hand brakes as an additional safeguard in case of damage or breakage to the air brake equipment. The President of the Canadian Street Rys. Association, Mr. McDonald, wrote the Board's Secretary suggesting that the hearing be deferred and that the question be taken up by one of the Board's officials with the Association, so that it might be thoroughly gone into and some conclusion recommended to the Board. The Board's Secretary replied that the request would be considered when the case came up for hearing.

At the Board's sitting on Dec. 7, Col. H. H. McLean, K.C., M.P., one of the Association's counsel, requested that the hearing be adjourned on account of the short notice given to companies, and that the whole question be referred to the Board's Chief Operating Officer to hold a conference with the Association's Executive Committee, so that it might be fully discussed. The Board granted an adjournment of the hearing to Feb. 4, and in the meantime the Association's Executive Committee will meet the Chief Operating Officer and go into the whole question. The Association believes that air brakes are unnecessary and impractical on single truck cars.

Electric Ry., Finance, Meetings, Etc.

British Columbia Electric Ry.—Gross earnings for Oct., 1909, \$264,306; operating expenses, \$131,679; net operating earnings, \$132,627; renewal funds, \$16,394; net earnings, \$116,233; approximate income from investments, \$16,500; net income, \$132,733, against \$197,630 gross earnings; \$96,075 operating expenses; \$101,555 net operating earnings; \$14,443 renewal funds; \$87,112 net earnings; \$13,550 approximate income from investments; \$100,662 net income for Oct., 1908. Aggregate gross earnings for four months ended Oct. 31, 1909, \$967,172; net earnings, \$454,296, against \$735,211 gross and \$356,210 net for same period 1908.

A dividend at the rate of 8% for the year was paid, Dec. 9, 1909, on the deferred ordinary stock, for the half year ended June 30, 1909.

Edmonton Radial Ry.—Traffic receipts for Nov., 1909, \$9,570.31, against \$1,613 for Nov., 1908. The number of passengers carried in Nov., 1909, was 229,798 against 37,362 in Nov., 1908.

Halifax Electric Tramway.—Traffic receipts for Nov., 1909, \$14,603.57, and for two weeks ended Dec. 14, \$6,900.92, against \$12,929.44 and \$6,400.40 for same periods 1908.

The Hospital for Sick Children
COLLEGE ST., TORONTO.

THIS APPEAL IS TO YOU!

REMEMBER That Every Sick Child in Ontario Whose Parents Cannot Afford to Pay for Treatment is Treated Free.

The Hospital for Sick Children had last year in its cots and beds 1,155 patients—383 of these were from 267 places in the Province. Sixty-five per cent. were children of poor people who could not afford to pay.



TWO CLUB FOOT CASES IN PLASTER.

Since its organization the Institution has treated 15,613 children; 11,550 of these unable to pay and were treated free.

If you know of any child in your neighborhood who is sick or has any deformity send the name of the parent to the Secretary.

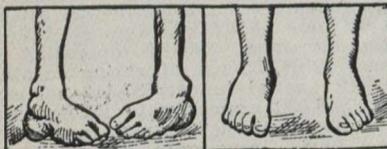


The Hospital for Sick Children is not a local but a great Provincial Charity for the sick child of the poor man in any part of Ontario has same claim upon its help as the child who lives within the shadow of its walls in Toronto.

There were 69 cases of Club Feet treated in the Hospital last year and 67 had perfect correction.



MASSAGING A PATIENT.

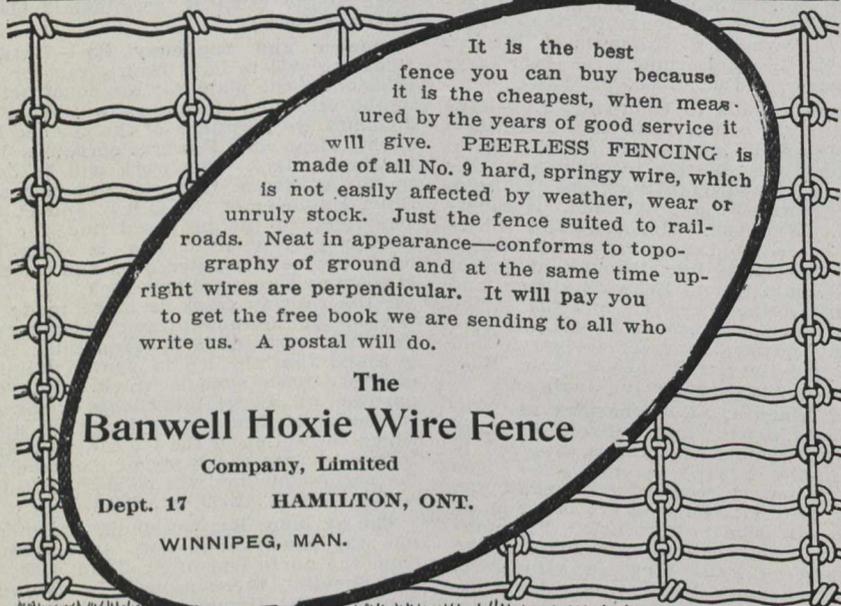


Just think of it—Your money can help the Hospital to do the good work of straightening the crooked limbs and club feet of little children. Please help us.

Please Send Contributions to J. Ross Robertson, Chairman, or to Douglas Davidson, Sec.-Treas., The Hospital for Sick Children, College St., Toronto.

The Ontario Government received \$416,936 from taxes levied on railways in the province during the last financial year, against \$400,227 in the previous year. Of this \$30,000 is applied towards the expenses of the Ontario Railway and Municipal Board.

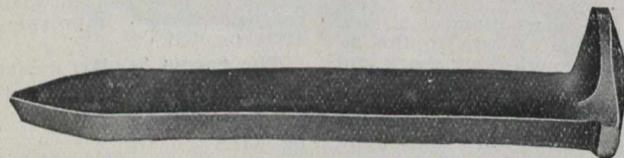
PEERLESS
The Fence that saves Expense



It is the best fence you can buy because it is the cheapest, when measured by the years of good service it will give. PEERLESS FENCING is made of all No. 9 hard, springy wire, which is not easily affected by weather, wear or unruly stock. Just the fence suited to railroads. Neat in appearance—conforms to topography of ground and at the same time upright wires are perpendicular. It will pay you to get the free book we are sending to all who write us. A postal will do.

The Banwell Hoxie Wire Fence Company, Limited
Dept. 17 HAMILTON, ONT.
WINNIPEG, MAN.

STRONGER
Than Stock-Weather and Wear



Railway Spikes

also

Track Bolts, Angle Bars and Tie Plates

—made by—

The Montreal Rolling Mills Co.

Montreal, Canada

The Hamilton, Waterloo and Guelph Ry. Co. has given notice that in addition to the other powers for which it is applying to the Dominion Parliament, it will ask for powers to increase its capital stock.

London St. Ry.—Gross earnings for Nov., 1909, \$18,964.07; expenses, \$14,211.51; net earnings, \$4,752.56; deductions, \$2,363.05; net income, \$2,389.51, against \$17,618.26 gross earnings; \$13,414.73 expenses; \$4,203.53 net earnings for Nov., 1908. Aggregate gross earnings for 11 months ended Nov. 30, 1909, \$221,685.18; expenses, \$154,361.38; net earnings, \$67,323.80; deductions, \$26,445.81; net income, \$40,877.99, against \$214,474.24 aggregate gross earnings; \$152,718.06 expenses; \$61,756.18 net earnings for same period 1908.

Montreal St. Ry.—Passenger earnings for Nov., 1909, \$323,446.50; miscellaneous earnings, \$11,424.77; total earnings, \$334,871.27; operating expenses, \$200,137.56; net earnings, \$134,733.71; city percentage on earnings, \$11,814.27; interest on bonds and loans, \$14,471.85; rent leased lines, \$498.67; taxes, \$4,000; total charges, \$30,784.79; surplus, \$103,948.92; expenses per cent. of earnings, 59.76, against \$292,848.63 passenger earnings; \$8,729.51 miscellaneous earnings; \$301,578.14 total earnings; \$180,682.03 operating expenses; \$120,896.11 net earnings; \$10,404.42 city percentage on earnings; \$16,113.30 interest on bonds and loans; \$444.43 rent leased lines; \$2,700 taxes; \$29,662.15 total charges; \$91,233.96 surplus; 59.91 expenses per cent. of earnings, for Nov., 1908. Aggregate total earnings for two months ended Nov. 30, \$688,878.22; operating expenses, \$374,872.53; net earnings, \$314,005.69; total charges, \$61,864.27; surplus, \$252,141.42; expenses per cent. of earnings, 54.42; against \$630,186.26 aggregate total earnings; \$346,106.05 operating expenses; \$284,080.21 net earnings; \$59,842.43 total charges; \$224,237.78 surplus; 54.92 expenses per cent. of earnings; for same period 1908.

Ottawa, Brockville and St. Lawrence Ry.—A new call of 5%, in lieu of a second call of 2% and a third call of 3% improperly made upon the shares of the company, has been made by the directors, to be paid by Jan. 2. The offices of the company are 38 Sparks St., Ottawa, and the Secretary is N. Belanger. (Nov., 1909, pg. 829.)

The Quebec Railway, Light, Heat and Power Co., the incorporation of which was announced in our Dec. issue, has an authorized capital of \$10,000,000 with head office at Montreal. In it are merged the Quebec Ry. Light and Power Co., Jacques Cartier Power Co., Quebec Gas Co., Frontenac Gas Co., and the Canadian Electric Co. The President is W. G. Ross, Managing Director Montreal St. Ry., and the Vice President, Frank Ross, of Quebec. The new company will have a substantial amount of cash at its credit to carry out proposed extensions and also a reserve of bonds for future development.

South Western Traction Co.—under the terms of the judgment respecting the sale of the property, bondholders and others claiming to have encumbrances on the S.W.T. Co. were required to produce their bonds or debentures with all unpaid coupons, and any other securities at the offices of the London and Western Trusts Co. by Dec. 31, 1909, for adjudication. The claims will be adjudicated by the Local Master of the High Court at London, Jan. 7. The formal transfer of the property was made Dec. 15 to the recent purchasers, who paid the balance of the purchase money into court. (See also London and Lake Erie Ry. and Transportation Co.)

Toronto Ry.—Gross earnings for Oct., 1909, \$332,976; operating expenses, maintenance, etc., \$169,067; net earnings, \$163,909, against \$306,857 gross earnings;

\$166,027 operating expenses, maintenance, etc.; \$140,830 net earnings for Oct., 1908.

Gross earnings for Nov., 1909, \$325,416.70; expenses, \$168,112.30; net earnings, \$157,304.40, against \$286,957.43 gross earnings; \$146,643.99 expenses; \$140,313.44 net earnings for Nov., 1908. Aggregate gross earnings for 11 months ended Nov. 30, 1909, \$3,515,684.40; expenses, \$1,789,199.24; net earnings, \$1,726,485.16, against \$3,223,036.57 aggregate gross earnings; \$1,708,838.23 expenses; \$1,514,198.34 net earnings for same period 1908.

Winnipeg Electric Ry.—Gross earnings for Oct., 1909, \$247,000; operating expenses, \$123,800; net earnings, \$123,200, against \$207,100 gross earnings; \$102,000 operating expenses; \$105,100 net earnings for Oct., 1908. Aggregate gross earnings for 10 months ended Oct. 31, 1909, \$2,087,900; net earnings, \$1,044,900, against \$1,735,400 gross and \$869,800 net for same period 1908.

Electric Railway Notes.

W. Murray has been elected President Toronto Street Railwaymen's Union for the current year.

The Hull Electric Co. has ordered two 21 ft. closed vestibule cars from the Ottawa Car Co., Ottawa.

The Nelson, B.C., St. Ry. Co. is asking tenders for two semi-convertible cars, and for station switching equipment.

The B.C. Electric Ry. is reported to have ordered five semi-convertible, pay-as-you-enter cars, 28 ft. long, in the U.S.

The Montreal and Southern Counties Ry. has received two 40 ft. centre aisle interurban cars from the Ottawa Car Co.

J. F. Goodwin has been appointed Superintendent Sherbrooke St. Ry., Sherbrooke, Que., vice P. J. Slattery resigned.

The Dominion Power and Transmission Co. is reported to contemplate purchasing 10 cars for service on the Hamilton St. Ry.

The Port Arthur and Fort William Electric Ry. commissioners have refused the demand of the motormen and conductors for increases in wages for the first and second year men.

The North Toronto town council passed a resolution, Dec. 16, to take a plebiscite on Jan. 1 on the question of a Sunday car service on the Metropolitan Division of the Toronto & York Radial Ry.

The Supreme Court dismissed the appeals of the Ottawa Electric Ry., Dec. 14, in two cases arising out of the accident on its Britannia line in May, 1908.

The London and Lake Erie Ry. and Transportation Co., formerly the South Western Traction Co., is reported to have decided to purchase four additional interurban cars during this year.

The Hull Electric Ry. has ordered three open cars, with centre aisles, walk-over seats, slat construction, air and hand brakes, white ash finish, with bodies 38 ft. long, vestibule at each end, 5 ft. 2 ins. long; wheel base, 6 ft.

The St. Thomas, Ont., Street Ry. Commissioners contemplate the purchase of two new cars, the installation of new motors, and the alteration of some cars, for which a bylaw to provide \$13,000 is to be submitted to the taxpayers.

A. J. Macdonald, at one time in the Montreal St. Ry. service, and latterly Superintendent Mexico Tramway Co., has been appointed Superintendent City Division Quebec Railway, Light and Power Co., vice H. L. Bartlett, resigned.

The Board of Railway Commissioners decided Dec. 7 to postpone until Feb. 4 the consideration of the question as to whether electric railways coming under

its jurisdiction should be compelled to fit cars with air brakes in addition to hand brakes.

L. Stevens, conductor, and J. Damlancourt, motorman, Montreal St. Ry., were arrested Dec. 3, charged with theft from, and damages to, fare boxes, while in charge of the fare box collecting car, between divisional centres and headquarters.

The Quebec courts refused, Nov. 24, to grant an injunction applied for by the Montreal city council to prevent the Montreal St. Ry. carrying freight on its lines other than for the city. Justice Fortin held that everyone as well as the city was profiting by the street railway carrying freight.

Three consulting engineers from New York spent some time in Montreal early in Dec., and it is said that the object of their visit was to obtain information upon which to prepare plans and estimates either for an elevated or an underground electric railway system in the centre of the city.

W. N. Warburton, ex-manager Windsor, Essex & Lake Shore Rapid Ry., sued the company recently for two months' pay, \$250, and for \$75 for additional board. The Local Master at Windsor disallowed the claim for board and allowed the company \$110 on a counter claim.

Wilford Phillips, Manager Winnipeg Electric Ry., is reported to have stated, Dec. 15, that a satisfactory agreement had been arrived at with the city regarding the erection of poles on Hespeler Ave., and that the company would, in due course, make an arrangement for the use of the conduits now under construction.

During the recent suspension of power production at the Winnipeg Electric Ry.'s power plant at Lac du Bonnet, caused by the breaking of one of the penstocks, a service was operated on the Winnipeg, Selkirk and Lake Winnipeg Electric Ry., by means of the old locomotive, which was retired when the road was electrified.

The Montreal city council has been complaining of the overcrowding of the Montreal St. Ry. cars, and the company in reply states that this overcrowding is aggravated, if not largely caused by the obstruction to traffic by vehicles getting on the tracks. The company asks the council to direct the police to see that its cars have the right-of-way as provided for in the contract.

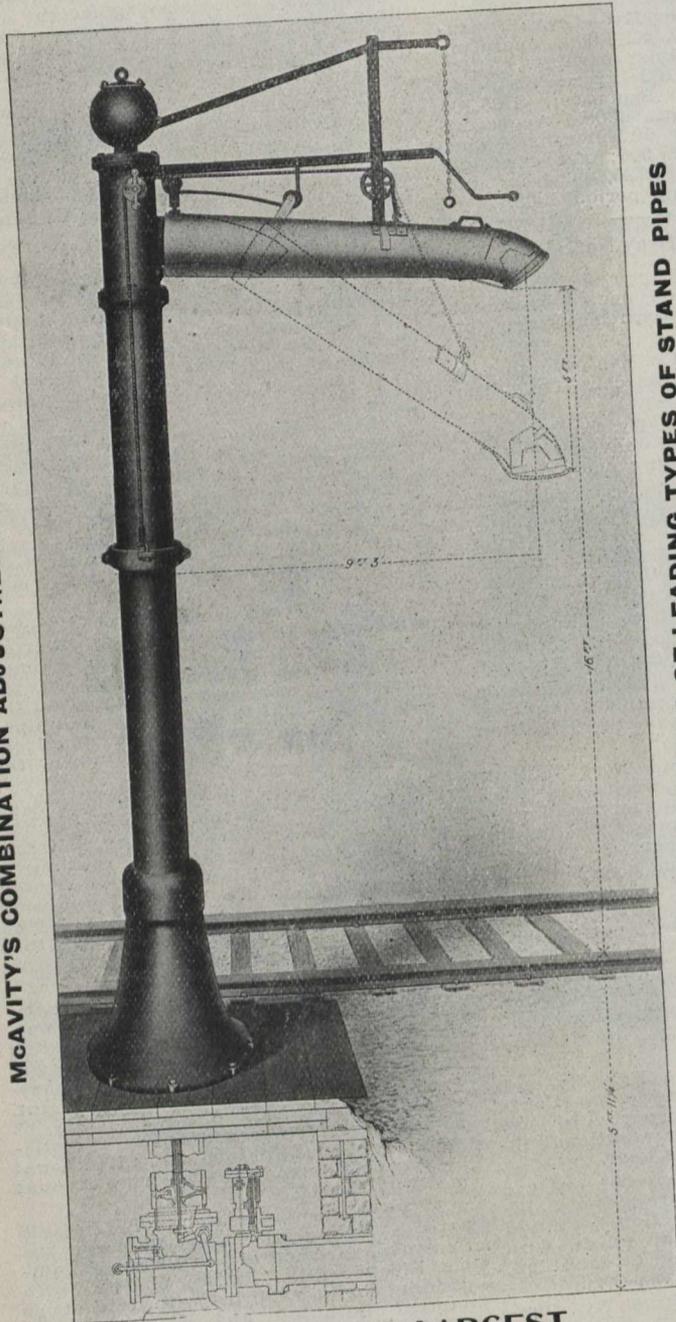
The Montreal city council finance committee reported recently that all outstanding accounts with the Montreal Street Ry., except the snow cleaning account, had been settled. The last matter to be settled was the tax account, which had been in dispute for six or seven years. The amount paid in settlement was about \$100,000, and the amount outstanding on the snow clearing account is about \$60,000.

A Vancouver dispatch of Dec. 16 says:—"Two years ago Maynard and Sharman, foremen of the British Columbia Electric Ry., were charged with padding the pay roll list with dead men's names. Both left, and Maynard implicated James Milne, Superintendent of the company. The latter was accused and served 18 months. Yesterday Maynard was re-arrested and confessed, exonerating Milne."

The British Columbia Electric Ry., in pursuance of its bonus scheme for employes, by which an amount equal to one-third of the amount available for dividend, after 4% has been made on the common stock, is distributed among employes who have been in the continuous service of the company, from July 1, of the year previous to the distribution, has this year distributed about \$50,000, the number of men participating being

T. McAVITY & SONS,
 LIMITED
 ST. JOHN, N. B.

McAVITY'S COMBINATION ADJUSTABLE SPOUT STAND PIPE



OLDEST AND LARGEST
 MANUFACTURERS OF

RAILWAY SUPPLIES

IN CANADA

INJECTORS, POP VALVES, CAR BRASSES,
 CAR HEATER FITTINGS, ETC.

SEND FOR CATALOGUE AND PRICE LIST.

EMBODIES BEST FEATURES OF LEADING TYPES OF STAND PIPES

KERR'S GLOBE AND GATE VALVES

STRICTLY HIGH GRADE. TESTED & PACKED

THE KERR ENGINE CO. LIMITED
 VALVE AND HYDRANT MANUFACTURERS
 WALKERVILLE, ONT.

E. L. DREWRY

REDWOOD BREWERY
 WINNIPEG, MANITOBA

MANUFACTURER OF THE
 CELEBRATED

REFINED ALE,
 EXTRA STOUT AND
 REDWOOD LAGER

Also the **GOLDEN KEY BRAND**
 AERATED WATERS

nearly 900, the individual amounts received being \$58.10.

The enquiry into the cause of the disaster on the British Columbia Electric Ry., whereby 15 passengers lost their lives recently, was concluded, Dec. 5, 1909, the verdict of the jury declaring that there was no criminal neglect on the part of the train crew, and suggesting that the company adopt increased safeguards until a method is found of keeping the tracks free from freight cars at night, and also that traffic on interurban lines should be governed by standard rules approved by the Board of Railway Commissioners.

The Supreme Court of Montreal recently awarded \$57.59 damages against the Montreal St. Ry., for injury to a horse, which was frightened by a band being played on one of the company's cars, and which ran into a plate glass window. The claim was for \$115.17, but it was found that there was contributory negligence. In delivering judgment, Justice Bruneau stated that there was no clause in the company's franchise which gave it the right or allows it to operate an electric band car through the streets for advertising purposes.

Electric Railway Track Laid in 1909.

Official reports received by us to Dec. 20, as to new track laid on electric railways during 1909, in several of which the figures were estimates, show that 48.50 miles were laid by 12 companies. The figures for the Winnipeg Electric Ry. represent double track replacing temporary single track.

	Miles.	Miles.
BRITISH COLUMBIA ELECTRIC RY.		
Extensions in Vancouver, etc., est.	5.00	17.00
New Westminster to Cloverdale, est.	12.00	
CALGARY (MUNICIPAL) ELECTRIC RY.		
Various lines (estimated)	5.00	
CHATHAM, WALLACEBURG & LAKE ERIE RY.		
Pain Court Jct. to Pain Court	4.00	
EDMONTON RADIAL RY.		
Alberta ave. to packing plant	2.52	
9th and Jasper to 21st street	.50	
1st st. to 8th and Vermillion	1.00	
Syndicate to Namayo and Jasper	1.15	5.17
HULL ELECTRIC CO.		
Laurier ave. to Main st.	2.25	
INTERNATIONAL TRANSIT CO.		
Upton rd. to Pine st., S. S. Marie	0.31	
MONTREAL & SOUTHERN COUNTIES RY.		
Montreal to St. Lambert	3.50	
St. Lambert to Montreal South	1.50	5.00
MONTREAL ST. RY.		
Short extensions on various streets	1.60	
MONTREAL PARK & ISLAND RY.		
Henderson to St. Vincent de Paul	2.55	
St. Denis	1.39	
Pie IX	.43	
Cote La Visitation	.96	5.33
PORT ARTHUR & FT. WILLIAM E. RY.		
Extension in Port Arthur	1.00	
Extension to Canada Iron Corp.	1.50	2.50
SARNIA ST. RY.		
George st. to Wellington st.	0.34	
Total (in part estimated)	48.50	
WINNIPEG ELECTRIC RY.		
Dufferin ave.	2.59	
Academy road	0.46	
Osborne st.	0.33	
Marion st.	0.52	
Notre Dame ave. west	0.17	4.07

DIVIDEND NOTICE.

The Northern Navigation Company of Ontario, Limited

The Board of Directors have to-day declared a yearly dividend at the rate of 8 per cent. per annum, payable January 15th, 1910, to shareholders of record as of January 10th, 1910.

Transfer books will be closed from the 11th day of January, 1910, until the 25th day of January, 1910.

The Annual General Meeting and a Special General Meeting will be held in the Board Room of the Traders Bank of Canada in the City of Toronto on Tuesday, the 25th day of January, 1910, at 2.30 o'clock in the afternoon.

H. H. GILDERSLEEVE,
Manager.

Toronto, December 29th, 1909.

Telegraph and Cable Matters.

W. M. Manchester, formerly C.N.R. telegraph operator at Rainy River, Ont., has been sentenced to two years imprisonment, for manipulating tickets and cash.

The Michigan Central Rd. is reported to have granted a 14% increase in wages to its telegraph employes, and the Pere Marquette Rd., is stated to be following suit.

D. G. Sturrock, Manager C.P.R. Telegraphs, Toronto, accompanied by his wife and family, left Toronto at the end of Nov., for a trip to the Pacific coast for the benefit of his health.

The Illinois Central Rd., has declined to increase the wages of its telegraph operators, and by consent, the matter is being submitted to the Chairman of the Interstate Commerce Commission and the Federal Labor Commissioner.

The C.P.R. Telegraph Department has opened offices at Deleau, Kellogg, Melbourne, Niverville, Purvis, Man.; Beaucage, Delamere, Moffat, Ont.; Adanac, Keeler, Kelso, Killaley, Phippen, Rokeby, Stockholm, Vandura and Wynyard, Sask.

The Temiskaming and Northern Ontario Ry. telegraphers have been granted increases in wages, for the current year, amounting to from 10 to 15%. Negotiations between the Commissioners and the employes have been in progress during the past six months.

A board of conciliation has been appointed, consisting of J. E. Atkinson, Chairman, W. Nesbitt, K.C., and W. T. J. Lee, all of Toronto, to enquire into the differences between the G.T.R. and its telegraphers and station agents stationed east of Detroit.

The Board of Railway Commissioners has dismissed the appeal against the telegraph rates which go into effect July 1, providing that code words used in messages of more than five letters shall be charged at an increased rate. Under the present rates, the limit is 10 letters.

Wireless telegraph messages were exchanged between the dual ports, Fort William and Port Arthur, Ont., and Duluth, Minn., Dec. 2, communication being established with the latter city's station by means of the steamboat H. P. Bope. It is stated that negotiations are in progress for the establishment of wireless telegraph stations at the head of the lakes.

The British and Colonial Press Service, Ltd., has been incorporated under the Dominion Companies Act, with a capital of \$100,000 and office at Montreal, to receive and transmit news from, and to, all points in the British Empire. For this purpose, it is stated, a contract has been entered into with the Marconi Wireless Telegraph Co., covering a number of years.

The Dominion Government wireless telegraph station at Ikeda, B.C., is being operated regularly, and with success, transmission to Victoria being made, for the most part, over land. Material is being assembled at Triangle Island for the construction of another station, similar to those at Pachena and Gonzales Hill. The Prince Rupert station was expected to be ready and in operation by the end of 1909.

The Marine Department report for the year ended March 31, 1909, which has been issued recently, shows that 20 wireless telegraph stations were operated by the Department. They are situated at Cape Race and Cape Ray, Nfld.; Heath Point, Anticosti; Whittle Rocks, Point Amour, Belle Isle, Point Rich, in the Gulf of St. Lawrence; Father Point, Clarke City, Fame Point, in the River St. Lawrence; Sydney, Cape Sable, Pictou, N.S.; Cape Bear, P.E.I.; Part-ridge Island, N.B.; Point Grey, Victoria, Pachena, Estevan and Cape Lazo, B.C.

Grain Elevator Notes.

The Vancouver Milling Co. has commenced work on the construction of an elevator of 50,000 bush. capacity at Granum, Alta. This will make five elevators at that point.

A bill to amend the Inspection and Sale Act by striking out the words "or cargo" in sections 98 and 99, and by reconstituting the Grain Survey Board, was given a first reading in the House of Commons, on Nov. 29, but the Minister of Agriculture announced its withdrawal.

The Dominion Millers' Association is applying to Parliament for amendments to its charter, to add to its powers for holding real estate; to enable it to manufacture and deal in grain products, own and operate grain elevators, vessels, wharves and shares in vessels in connection with its business, and for other purposes.

The Goderich Elevator and Transit Co., proposes to construct a cement and steel annex to its present elevator at Goderich, Ont., thus increasing its capacity by 500,000 bush. A by-law is being submitted to the ratepayers for the exemption of the company's present plant and the proposed additions, from all municipal taxation for ten years from Jan., 1911.

The Grand Trunk Pacific Elevator Co.'s elevator at Tiffin, Ont., which was fully described in our Dec., 1908, issue, has made some exceedingly good records. During Nov., 1909, the Chicago and St. Lawrence Steam Navigation Co.'s steamboat, E. B. Osler, with 528,000 bush. was unloaded in 21 hrs., an average of 25,143 bush an hour. This is stated to be a record for unloading at any Canadian elevator, and also the largest load of grain ever carried on a Canadian vessel. Several other quick unloadings took place throughout the season, averaging from 21,000 to 25,000 bush. an hour. The figures quoted include the cleaning up of all grain in the holds. From figures given on another page, it will be seen that over 10,000,000 bush. of grain were received at this point, from the head of the lakes. The elevator was constructed by the John S. Metcalf Co., of Montreal and Chicago.

Among the Express Companies.

The Dominion Ex. Co., is suing the city of Brandon, Man., in respect of the local business tax, claiming that as it pays the provincial corporation tax, it should not be called upon to pay a local business tax in addition.

W. L. Rutledge and W. J. Burgess, the latter formerly a Canadian Ex. Co. employe, are being charged with complicity in the recent robbery at the company's office at Truro Station, N.S., when money and money orders to the value of \$15,000 were stolen.

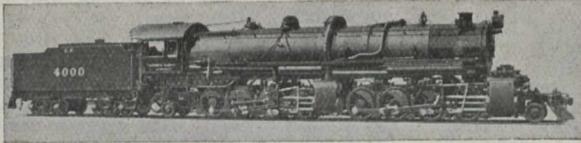
The United States Ex. Co., has issued writs against R. W. Hulbert and O. J. B. Yearsle, Toronto, to recover \$622.91, freight on certain goods, or for the return of the goods, and for damages for wrongful conversion, and also to set aside as fraudulent, a bill of sale on the goods made by the former in favor of the latter.

An application by the city of Chatham, Ont., to commit E. Fremlin, Agent Dominion Ex. Co., there, for his refusal to produce books and records of the company in his custody, under a subpoena, in relation to the sending of large sums of money to China by Chinese laundry keepers who are attacking the by-law fixing taxation for such laundries, was dismissed at Toronto, Dec. 7, 1909.

BALDWIN LOCOMOTIVE WORKS

Manufacturers of

**BROAD AND NARROW GAUGE
SINGLE EXPANSION AND COMPOUND**



LOCOMOTIVES

Mine, Furnace and Industrial Locomotives

**Electric Locomotives with
Westinghouse Motors and Electric Trucks**

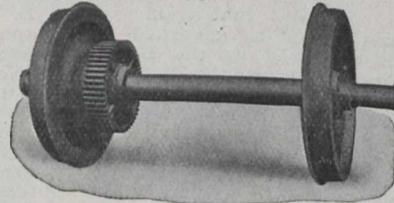
**Principal Offices and Works, 500 North Broad Street
PHILADELPHIA, PA., U.S.A.**

Cable Address:—"Baldwin," Philadelphia

STANDARD STEEL WORKS CO.

Harrison Building, Philadelphia, Pa., U.S.A.

**THE BRYDGES ENGINEERING AND SUPPLY CO.
WINNIPEG, MAN. Limited Representatives**



Wheels mounted on axles fitted with motor gear ready for application to equipment

STANDARD

**SOLID FORGED AND ROLLED STEEL WHEELS
STEEL TIRED WHEELS STEEL AND IRON AXLES
ELLIPTIC AND HELICAL SPRINGS**

The McConway & Torley Co.

PITTSBURG, PA.

Manufacturers of the

**JANNEY,
JANNEY "X"**

AND

PITT FREIGHT COUPLERS

BUHOUP 3-STEM EQUIPMENT

BUHOUP VESTIBULE EQUIPMENT

**MALLEABLE IRON AND STEEL CASTINGS
FOR RAILROAD USE**



Underwood

This is the mark of the Underwood—more extensively used in Canada than all other makes of typewriters combined. No matter what machine you have used, or are using, you will ultimately buy the Underwood.

UNITED

TYPEWRITER COMPANY LIMITED

Adelaide Street East

TORONTO

and all other Canadian Cities

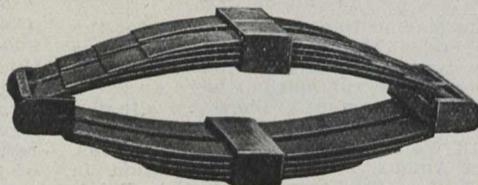
RAILWAY SPRINGS

ELLIPTIC

SEMI-ELLIPTIC

AND SPIRAL SPRINGS

OF EVERY DESCRIPTION



MANUFACTURED BY

B. J. Coghlin & Co., 432 St. Paul St., Montreal, Can.

MARINE DEPARTMENT.**The Shipping Federation of Canada.**

PRESIDENT, H. A. Allan, Montreal; MANAGER, AND SECRETARY, T. Robb, 526 Board of Trade, Montreal.

Dominion Marine Association.

PRESIDENT, C. J. Smith, Montreal; COUNSEL, F. King, Kingston, Ont.

Canadian Association of Masters and Mates.

GRAND MASTER, Capt. F. Scott, Collingwood, Ont.; GRAND SECRETARY-TREASURER, Capt. H. O. Jackson, 376 Huron St., Toronto.

Dominion Marine Association.

Many matters of deep importance to marine interests were considered at the meeting of the Executive Committee of the Dominion Marine Association in Toronto, Dec. 14. It was decided to send a strong deputation to appear before the Senate Committee on Banking and Commerce to oppose the provisions of the insurance bill in so far as it relates to marine interests. It is held that the bill would render it impossible for ship owners to secure insurance, as it is not possible to secure it in licensed companies in Canada. The association maintains that if the bill becomes effective it will mean that all grain would be sent from Duluth to Buffalo. The view of the association as set forth in the Montreal resolution maintained the right of the individual to insure in any quarter he desired, and this, it was held, should be the first principle of any legislation. It was also held that in any insurance the party to be penalized should be only the company soliciting insurance or carrying on business through an established agency in Canada without license.

For many years Ontario boats entering Montreal have been discriminated against in respect to pilotage dues. Any boat from this province entering Montreal has to pay a pilotage charge of \$5, and this irrespective of the fact that the pilot's services are never brought into requisition. In regard to boats arriving from any port in Quebec or the Maritime Provinces no such charge is exacted, and the Ontario marine men urge the passing of legislation that will place Ontario in the list of the exempted provinces in respect to pilotage dues. A bill to this end has been introduced in the House of Commons by Mr. Edwards.

Opposition is urged to the tonnage tax imposed this year by U.S. Congress on all boats entering the United States, starting from a Canadian port. For some years the United States Department of Commerce and Labor has been endeavoring to have some such legislation enacted with special reference to ocean-going vessels. Failing in this a clause was slipped in the new tariff and the provisions now apply to lake vessels as well as ocean liners. F. King, Counsel for the Association, has had the matter in hand with counsel for the lake carriers of the U. S., and has had interviews with the Commissioner of Navigation at Washington. Legislation is expected at this session of Congress to exempt the Great Lakes from this law. It is realized that retaliation by Canada would come hard on the heavy U. S. tonnage on the lakes.

The committee considered at length the pending legislation now before the Dominion Government. The association is not opposed to Mr. Sinclair's bill regarding steamboat inspection certificates, and Mr. Brodeur's bill in regard to water carriage of goods also finds favor. This bill corresponds with the Harter Act of the United States, and results from a conference of all interests in the Senate at a previous session of Parliament.

In respect to bill 10, requiring load lines on vessels, the association is not opposed to the measure but to the method of application. If some uniform system of rules for fixing the location of the "Plimssoll mark" is adopted, it would meet with the approval of vessel owners. The proposal to require all steamers to furnish a list of passengers and crew to the Customs officer before leaving port was condemned as impracticable, as was the suggestion in the same bill that two-thirds of the cargo should be in the lower hold.

Bill 11, requiring wireless telegraph installation on lake steamers over 400 tonnage, was opposed, it being held that lake navigation should be exempt from this exaction, as the trips are short and the ships close together. In similar legislation introduced in the U.S. Congress recently, it was held that lake vessels should be exempt.

Bill 54, introduced by Mr. Fisher abolishes the official weighing of grain into vessels at Upper Lake ports. This accords with previous resolutions of the Association, faulty certificates being found more embarrassing than useful.

It was decided to continue to oppose the building of the Long Sault dam near Cornwall, and to require the complete plans and specifications to be submitted in accordance with the undertaking given by the promoters at the last session of the International Waterways Commission on this subject.

Resolutions were adopted thanking the authorities and officials and men for the excellent services given vessels this season on the Lachine Canal—asking for men to handle lines on the following additional locks—the paper mill lock in the Cornwall Canal—the lower entrance of the Morrisburg and Farran's Point Canals, and the head of the Soulanges Canal. Asking for signal lights on Lachine Canal lock gates to indicate whether gates open or closed. Asking for better protection against bad weather at the head of the Soulanges Canal.

The association commends the use of pointed and square top buoys to assist in distinguishing starboard and port painted spar buoys in bad lights; and recommends the method of lighting the Williamsburg Canals on the St. Lawrence, the Morrisburg, Farran's Point and Rapide Plat.

The Empress of Ireland's Disaster.

The cause responsible for the damage sustained by the C.P.R. steamship Empress of Ireland near Ste. Felicite, on the south shore of the Gulf of St. Lawrence, on Oct. 14, while en route to Quebec, has been investigated by Capt. L. A. Demers, acting Wreck Commissioner, with Capt. Jas. Bain and C. Von Koenig as assessors. At the first sitting on Oct. 26 the Captain, Second and Third officers, Quarter Master and Chief Engineer were examined, as well as Capt. Walsh of the C.P.R. Marine Service, and Diver Begin. The evidence showed that the ship's draft at the time of the casualty was 25 ft. forward and 26½ ft. aft, while her speed of 18½ knots an hour, after taking into consideration the strong head wind effect, was estimated to have actually been reduced to 16½ knots over the water. Hazy and foggy weather prevailed from the Straits to Anticosti, but thence forward to the happening it was clear and fine. Cape Magdalen was passed at a distance of 4½ miles, ascertained through a four point bearing, and a course was then set which brought the vessel two miles off Martin River, which distance was also authenticated through a four point bearing, but from Martin River to Cape Chatte the Captain declared that courses steered necessarily varied in accordance with bend of the river and that a distance of two miles

from shore was maintained. Off Cape Chatte, however, the distance was found to be 1¼ miles, and as the vessel proceeded, cross bearings were taken on points of land in the vicinity of Les Mechins.

When off Ste. Felicite at 11.04 a.m. a shock was experienced, followed by a rumbling and a grating sound, the vessel heeling slightly to starboard under effect of impact, which listing remains, however, uncorroborated by testimony of some of the witnesses. Although the shock was insufficient to cause serious apprehension the Captain nevertheless ordered helm put hard to port, but immediately countermanded it by the order "Keep your course," the vessel having, it is estimated, in the meantime, swung three points to starboard. Simultaneously with alteration to helm, the speed of ship was reduced to slow, and cross bearings off Matane lighthouse and Ste. Felicite fog station placed the vessel two miles from shore and one mile from Roix Rock, while "no bottom" was reported following a cast of the lead at 17 fathoms. An examination of the ship after she had cleared the obstruction disclosed the fact that leakage was confined to one compartment, and she therefore proceeded on her journey to Quebec harbor, where she was berthed without further mishap. The evidence elicited was unanimous in setting forth that the vessel was navigated with customary skill and precaution, while it was the consensus of opinion in declarations made that the nature of the shock justified the belief that the vessel struck a submerged object—presumably wreckage. Diver Begin, who made a thorough examination of the ship's bottom, and who has had 20 years' experience in similar work, emphatically stated that the damage sustained was not caused by rock but by the vessel coming in contact with submerged wreckage. Taking into consideration the nature of evidence adduced, the Minister of Marine directed that a survey be made of the place where the ship struck, and Commander Miles, R.N., under whose immediate supervision the survey was conducted, submitted a plan indicating soundings taken as well as a report wherein he states that soundings made within a radius of two miles from Roix Rock, embracing position of ship at time of mishap, are exactly as represented on the chart, and furthermore that he has failed to trace even the slightest vestige of a submerged or sunken wreck.

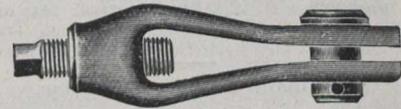
At a second sitting, Oct. 23, counsel representing the owners produced documents and affidavits from experts who had examined in England the nature of the damage to ship, and reported thereon, as follows: Geo. Hepburn & Son, consulting engineers, naval architects and technical referees; Flannery & Given, consulting engineers; H. Smith of H. & C. Grayson, shipbuilders and engineers. These gentlemen after a thorough examination of the ship's bottom, unanimously assert that damage was caused by vessel coming in contact with or passing over a submerged wreck, held in suspension, or some object other than rock. H. Mowatt, Marine Superintendent C.P.R., and H. Butterworth, C.P.R. Supt. Engineer, both made declarations that upon making an examination of the vessel's bottom a small piece of old wood measuring 5 or 5½ inches long was found jammed hard in one of the butt straps on the port side. R. Fayle and W. Braine, who were waiters on the Empress at the time of the mishap, testified to having seen floating wreckage near the ship's side a minute or so subsequent to the shock, which wreckage consisted of a spar approximating 20 ft. long seen on the starboard side, as well as several pieces on the port side, one of which appeared to be part of a deck. J. Lepage, foreman of repair for G. T. Davie & Sons,

TURNBUCKLES



FORGINGS
OF ALL KINDS

CLEVIS NUTS



CLEVELAND CITY FORGE & IRON CO.
CLEVELAND, OHIO, U.S.A.

DOMINION BRIDGE CO., LTD., MONTREAL, P.Q.
BRIDGES
TURNTABLES, ROOF TRUSSES
STEEL BUILDINGS
ELECTRIC and HAND POWER CRANES
Structural METAL WORK of all kinds

BEAMS, CHANNELS, ANGLES, PLATES, ETC., IN STOCK

G.P.R. LANDS

The Canadian Pacific Railway Company have 9,000,000 acres of selected lands for sale in Manitoba, Saskatchewan and Alberta.

Maps, as enumerated below, showing these lands in detail, will be sent free on application.

Map No. 1—Winnipeg to Second Meridian.....	\$ 8.00 to \$15.00 per acre.
Map No. 2—South-Eastern Saskatchewan, 2nd to 3rd Meridians.....	10.00 to 25.00 per acre.
Map No. 3—Main Line, 3rd Meridian to Range 10, W. 4th Meridian (generally).....	8.00 to 15.00 per acre.
Map No. 5—South-Western Alberta.....	8.00 to 15.00 per acre.
Map No. 6—Part of Alberta, Edmonton, Battle and Saskatchewan Rivers Districts—4th Meridian to Range 7, West 5th Meridian.....	10.00 to 25.00 per acre.
Map No. 7—Part of Western Saskatchewan, 3rd to 4th Meridians.....	10.00 to 25.00 per acre.

All prices are subject to change without notice.

TERMS OF PAYMENT

An actual settler may purchase not more than 640 acres on the ten instalment plan by paying a cash instalment at time of purchase, interest at six per cent. on the unpaid purchase money at the end of the first year, and the balance of the principal, with interest, in nine equal instalments annually thereafter, as shown in the following table:

160 Acres at \$ 8.00 per acre, cash payment \$191.70	first year's interest \$ 65.28	and nine instalments of \$160.00	
" " 9.00 " " " 213.70	" " " 73.46	" " " 180.00	
" " 10.00 " " " 239.70	" " " 81.62	" " " 200.00	
" " 11.00 " " " 263.60	" " " 89.78	" " " 220.00	
" " 12.00 " " " 287.60	" " " 97.96	" " " 240.00	
" " 13.00 " " " 311.55	" " " 106.10	" " " 260.00	
" " 14.00 " " " 335.60	" " " 114.32	" " " 280.00	
" " 15.00 " " " 359.50	" " " 122.44	" " " 300.00	

Purchasers who do not undertake to go into residence on the land are required to pay one-sixth of the purchase money down, balance in five equal annual instalments with interest at the rate of six per cent. per annum. Interest at six per cent. will be charged on overdue instalments.

F. T. GRIFFIN, Land Commissioner, Winnipeg.

CANADA NORTH-WEST LAND CO.

This Company has 525,000 acres of selected lands in Manitoba and Saskatchewan which offer excellent opportunities to settlers and investors who desire to secure good lands in well-selected districts. These lands are on sale at the Company's Office at Winnipeg, and at the various land agencies of the Canadian Pacific Railway Company.

F. T. GRIFFIN, Land Commissioner, Winnipeg.

I. MATHESON & CO., LIMITED
NEW GLASGOW, NOVA SCOTIA

CORNISH, LOCOMOTIVE, MARINE, STATIONARY
AND OTHER BOILERS

Hoisting, Portable and Stationary Engines
Brass, Iron and Grey Iron Castings
Mining, Coal Handling and Stamp Mill
Machinery

OCEAN STEAMSHIP OFFICES

AMERICAN LINE

Plymouth—Cherbourg—Southampton
Sailing from New York Saturdays.
Philadelphia—Queenstown—Liverpool
Sailing from Philadelphia Saturdays.

ATLANTIC TRANSFERT LINE

New York—London
Sailing from New York Saturdays.

WHITE STAR DOMINION LINE

Portland to Liverpool—Winter
Montreal—Quebec—Liverpool
Montreal to Avonmouth Docks
(Bristol and Antwerp)

RED STAR LINE

New York—Antwerp—Paris
Sailing from New York Wednesdays.

WHITE STAR LINE

New York—Liverpool—Queenstown
Sailing from New York Saturdays.
N.Y.—Plymouth—Cherbourg—Southampton
Sailing from New York Wednesdays.

NEW YORK AND BOSTON
MEDITERRANEAN SERVICE
To Italy via Azores—Gibraltar

Sub-agents at all principal points in Ontario, where accommodation can be reserved and tickets secured.

H. G. THORLEY,
PASSENGER AGENT FOR ONTARIO
41 KING ST. EAST, TORONTO.

testified that he had superintended the temporary repairs made to the Empress, and it was his opinion, after a lengthy service in similar work, that the nature of the damage justified him in reaching the conclusion that it could only have been caused by a submerged wreck.

On Nov. 5 the Minister of Marine cabled the High Commissioner for Canada, requesting that the Board of Trade have an examination made of the vessel's hull. T. Miller, Principal Officer of the Board of Trade Surveyor's Office, expresses some doubt as to the nature of the object which caused the damage, and it does not appear to him that the injuries sustained could have been inflicted by the vessel passing over a submerged derelict, but he states that the damage may have been caused by the vessel passing over a very smooth boulder like surface. A. H. F. Young, Principal Officer, states that he failed to detect the slightest indication that the object struck was of a rocky nature. W. Archer, Principal Ship Surveyor of Liverpool, declares that the result of his

inspection is not conclusive either way, but he is inclined to the belief that the Empress struck a waterlogged iron vessel. W. Howell, Assistant Secretary of the Board of Trade, states that in accordance with instructions from the Board of Trade the examination of the Empress had been made by the Surveyor of the Department, and as it appeared difficult to form a really definite opinion as to cause responsible for damage sustained, the services of the Principal District Officer as well as those of the Principal Ship Surveyor were called into requisition, and extracts from their individual reports have been cited above.

At a third sitting on Dec. 18 the court decided that in view of the almost unanimous opinion of various experts who thoroughly examined the damaged hull, setting forth that the injuries were incurred by vessel coming in contact with the submerged hull of a derelict probably held in suspension, the Court is of opinion that no blame can be attached to any one for the casualty.

Notices to Mariners.

The Department of Marine has issued the following:—

No. 112. Nov. 17. 292.—Ontario, Lake Huron, entrance to Georgian Bay, Devil Island channel, day beacons established. 293.—Ontario, Georgian Bay, northeast end chart of Key Harbor and its approaches issued. 294.—Ontario, Lake Superior, Otter Island, hand fog horn at light station.

No. 113. Nov. 18. 295.—Ontario, River St. Lawrence, Galops Canal to North Channel, changes in buoyage. 296.—Ontario, Georgian Bay, south end, Mary Ward ledges, intended change in position of westerly buoy. 297.—United States of America, Lake Erie, Detroit River mouth, Bar Point shoal, light vessel moved.

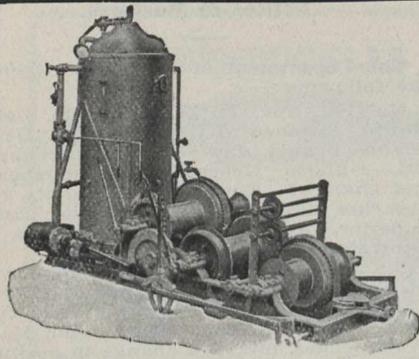
No. 114. Nov. 22. 298.—Ontario, Georgian Bay, south side, Collingwood harbor, shoal spots in dredged channel, caution. 299.—Ontario, Georgian Bay, east side, Victoria harbor, hydrographic information.

LIST OF STEAM VESSELS REGISTERED IN CANADA DURING OCT. AND NOV., 1909.

Name	No.	Where and When Built.	Engines, etc.	Length	Breadth	Depth	Gross Tons	Reg. Tons	Port of Registry	Owners
Amisk.....	122,275	Selkirk, Man., 1909.....	Screw 10 n. h. p.	64.0	13.0	4.5	32	21	Winnipeg.....	Beaver Lumber Co., Winnipeg.
Amigo.....	122,438	Walkerville, Ont., 1907.....	" 6 " "	41.0	10.3	3.8	19	17	Sault Ste. Marie, Ont.	C. L. D. Sims, Manitowaning, Ont.
Anamoose.....	126,508	Kaslo, B.C., 1909.....	" 4 " "	70.3	23.0	5.8	68	46	Victoria.....	E. Cooke, Kaslo, B.C.
A. R. Hellen.....	126,632	Adams Lake, B.C., 1909.....	Paddle 9 " "	123.5	26.8	4.9	33	39	Vancouver, B.C.....	Adams River Lumber Co., Chase, B.C.
Corinthia.....	126,289	New York, 1903.....	Screw 31 " "	80.1	16.0	6.6	57	39	St. John, N.B.....	R. Thomson, St. John, N.B.
Earl Grey.....	126,525	Barrow-in-Furness, Eng., 1909.....	" " " "	265.0	47.7	24.1	2357	930	Ottawa.....	Department of Marine and Fisheries.
Equal Rights.....	126,417	Birkendale, Ont., 1909.....	Screw 1 n. h. p.	42.8	11.2	4.0	14	6	Toronto.....	R. A. Robertson, Birkendale, Ont.
Exota.....	126,287	Springfield, N.B., 1909.....	" 7 " "	34.2	9.7	3.3	14	9	St. John, N.B.....	W. E. Vaughan, Fredericton, N.B.
F. E. C.....	126,522	Sturgeon Falls, Ont., 1907.....	Paddles 2 " "	37.8	12.0	3.3	22	18	Ottawa.....	F. E. Clark, Sturgeon Falls, Ont.
Frances Martin.....	126,651	Penetang, Ont., 1909.....	Screw 3 " "	50.3	12.4	5.1	27	13	Midland, Ont.....	W. Martin, Penetanguishene, Ont.
Francois C.....	126,454	Sorel, Que., 1909.....	" 13 " "	86.0	17.1	5.8	126	49	Sorel, Que.....	F. Crepeau, Sorel, Que.
Gow Ganda.....	126,521	Sturgeon Falls, Ont., 1907.....	" 6 " "	46.4	11.3	4.2	25	20	Ottawa.....	F. E. Clark, Sturgeon Falls, Ont.
Island Lassie.....	116,632	Lindsay, Ont., 1907.....	" 6 " "	37.0	6.0	3.0	7	5	Lindsay, Ont.....	W. E. Austin, Fenelon Falls, Ont.
vy Clark.....	126,523	Sturgeon Falls, Ont., 1907.....	" 2 " "	46.8	14.2	7.5	28	20	Ottawa.....	C. W. Clark, Sturgeon Falls, Ont.
Kingsway.....	122,938	Lytham, Eng., 1906.....	" 55 " "	125.9	22.1	11.6	247	85	Vancouver, B.C.....	W. Johnston, Vancouver, B.C.
Maxwell A.....	126,001	Bay City, Mich., 1909.....	" 24 " "	80.0	21.0	7.3	107	72	Southampton, Ont.....	D. MacAuley, Southampton, Ont.
Muskat.....	126,524	Simcoe, Ont., 1908.....	Paddle 2 " "	52.5	16.0	3.2	35	19	Ottawa.....	Upper Ottawa Improvement Co., Ottawa.
Navarch.....	126,194	Boston, Mass., 1892.....	Screw 5 " "	51.8	10.5	5.4	20	14	Windsor, Ont.....	Ontario Public Works Department, Public Works Department, Ottawa.
Peel.....	126,683	Sorel, Que., 1909.....	" 46 " "	91.5	22.1	10.7	205	117	Montreal.....	Public Works Department, Ottawa.
Prince Olaf.....	126,611	Port Essington, B.C., 1909.....	" 1 " "	28.8	9.0	3.0	4	3	Prince Rupert, B.C.....	T. M. Orwig, Port Essington, B.C.
Ride A. Wee.....	126,641	Long Point, Ont., 1909.....	" 1 " "	27.0	10.0	3.0	6	4	Port Dover, Ont.....	S. B. Cook, Long Point, Ont.
R. J. Skinner.....	126,630	Vancouver, B.C., 1909.....	" 5 " "	48.0	11.5	5.4	27	18	Vancouver, B.C.....	B. C. Commissioner of Lands, Victoria.
Rij Hector.....	122,277	Selkirk, Man., 1908.....	" 19 " "	72.0	16.0	8.0	70	48	Winnipeg.....	Public Works Department, Ottawa.
T. R.....	126,629	Retreat Cove, B.C., 1908.....	" 3 " "	33.0	9.5	4.0	13	9	Vancouver, B.C.....	T. R. McLay, Nanaimo, B.C.
Teign.....	126,625	Vancouver, B.C., 1909.....	" 3 " "	33.0	9.4	3.3	13	9	Vancouver, B.C.....	S. A. Harris, M.O., Vancouver, B.C.
Tenno.....	107,430	Detroit, Mich., 1892.....	" 13 " "	64.0	12.6	4.4	25	17	Brockville, Ont.....	W. R. Travers, Toronto.
Un me.....	126,684	West Lynn, Mass., 1907.....	" 4 " "	36.7	9.9	6.0	14	9	Montreal.....	J. P. Black, Montreal.
Vermillion.....	126,387	Grand Piles, Que., 1909.....	Paddle 3 " "	56.5	14.6	3.2	87	52	Quebec, Que.....	W. Ritchie, Three Rivers, Que.
Victoria.....	122,276	Selkirk, Man., 1905.....	Screw 10 " "	55.0	11.0	4.0	28	19	Winnipeg.....	Public Works Department, Ottawa.
Vital Spark.....	126,627	United States.....	" 2 " "	36.2	10.5	3.5	10	7	Vancouver, B.C.....	J. Wallace, Vancouver, B.C.
West Vancouver.....	126,631	Vancouver, B.C., 1909.....	" 4 " "	41.5	9.5	4.0	15	10	Vancouver, B.C.....	J. Lawson, North Vancouver, B.C.
Yoshino.....	126,634	Stevenson, B.C., 1909.....	" 2 " "	30.0	7.7	3.5	6	4	Vancouver, B.C.....	M. M. Hashimoto, Vancouver, B.C.

LIST OF SAILING VESSELS AND BARGES REGISTERED IN CANADA DURING OCT. AND NOV., 1909.

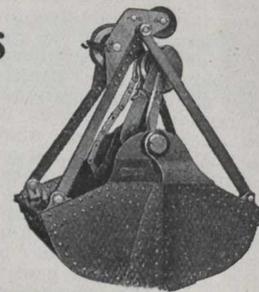
Name	No.	Where and When Built	Rig	Length	Breadth	Depth	Reg. Tons	Port of Registry	Owners
A. Yergeau.....	126,682	Notre Dame de Pierreville, Que., 1909.....	Sloop ..	108.0	23.2	7.5	132	Montreal.....	A. Yergeau, Pierreville, Que.
C. J. B.....	126,385	Escoumains, Que., 1909.....	Schr....	67.5	21.0	5.7	51	Quebec, Que.....	C. J. Belanger, Escoumains, Que.
Dianthus.....	77,607	Petite Riviere, N.S., 1878.....	" " "	58.0	18.8	7.0	49	Charlottetown, P.E.I.	M. McKinnon, Montague Bridge, P.E.I.
Dorothy Duff.....	117,164	Montague Bridge, P.E.I., 1909.....	" " "	98.0	26.7	10.6	152	Sydney, N.S.....	W. Duff, Carbonear, Newfoundland.
Eneau.....	124,681	Notre Dame de Pierreville, Que., 1909.....	Sloop ..	108.9	23.2	7.3	145	Montreal.....	E. L. Daneau, Notre Dame de Pierreville, Que.
Eskimo.....	126,591	Apple River, N.S., 1909.....	Schr....	79.2	27.6	6.8	99	Parsonsboro, N.S.....	C. T. White & Son, East Apple River, N.S.
F. G. No. 1.....	126,686	Cardinal, Ont., 1909.....	Scow....	40.0	20.1	4.7	92	Montreal.....	F. Gilbert, Montreal.
Frank H. Adams.....	126,581	Lunenburg, N.S., 1909.....	Schr....	108.4	25.8	10.5	93	Lunenburg, N.S.....	F. Anderson, Montreal.
General Meade.....	112,192	Toledo, Ohio.....	Ured....	72.5	28.5	7.0	244	Chatham, Ont.....	C. S. Boone, Toronto.
Horman Lee.....	126,294	New Harbour, N.S., 1909.....	" " "	41.2	12.9	6.8	17	Canso, N.S.....	Whitman Fish Co., Canso, N.S.
Ibessa.....	126,292	Tancook, N.S., 1908.....	" " "	41.6	12.4	6.5	17	" " "	J. Sampson, M.O., Dover, N.S.
Jeanne A. Pickles.....	126,016	Bridgetown, N.S., 1909.....	" " "	139.0	33.0	11.6	300	Annapolis Royal, N.S.	F. Pickles, M.O., Annapolis Royal, N.S.
Kimprose.....	126,685	Yamaska, Que., 1909.....	Sloop ..	109.3	23.2	8.0	146	Montreal.....	M. Robidoux, Yamaska, Que.
Laurin and Leitch No. 1.....	126,687	Montreal, 1909.....	Dred....	74.0	40.0	5.9	297	" " "	T. Bastien, J. Laurin & W. C. Leitch, Montreal.
Lavengro.....	126,189	Shelburne, N.S., 1909.....	Schr....	127.0	30.4	12.9	269	Shelburne, N.S.....	G. A. Cox, M.O., Shelburne, N.S.
Little Lake.....	122,569	Peterboro, Ont., 1909.....	Scow....	71.0	21.0	4.0	50	Peterboro, Ont.....	W. Irwin, & D. Conroy, Peterboro, Ont.
Neree Harvey No. 1.....	126,690	Isle aux Coudres, Que., 1909.....	Schr....	64.6	20.0	7.4	50	Montreal.....	N. Harvey, Isle aux Coudres, Que.
Ponhook.....	126,038	Liverpool, N.S., 1909.....	" " "	116.3	29.5	11.4	199	Liverpool, N.S.....	A. W. Hendry, Liverpool, N.S.
Sesame.....	126,582	La Have, N.S., 1909.....	" " "	37.2	11.2	6.2	15	Lunenburg, N.S.....	J. Ernst, La Have, N.S.
V. T. B. 7.....	126,628	North Vancouver, B.C., 1909.....	Barge ..	82.7	30.1	7.5	178	Vancouver, B.C.....	Vancouver Tug & Barge Co., Vancouver, B.C.
Winnie May.....	126,293	Cole Harbor, N.S., 1909.....	Schr....	35.0	11.0	5.0	10	Canso, N.S.....	G. C. Jamieson, M.O., Cole Harbor, N.S.



M. Beatty & Sons, Limited Welland, Ont.

**Dredges - Ditchers - Derricks
Steam Shovels
Steel Dump and Deck Scows**

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



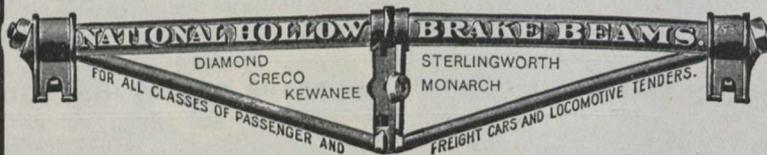
E. B. LEIGH,
Pres. & Gen. Mgr.

GENERAL OFFICES
46th, Robey and Lincoln
Streets.

General Sales Office,
Fisher Building,
CHICAGO, - - ILLINOIS

CHICAGO RAILWAY EQUIPMENT CO.

Manufacturers of

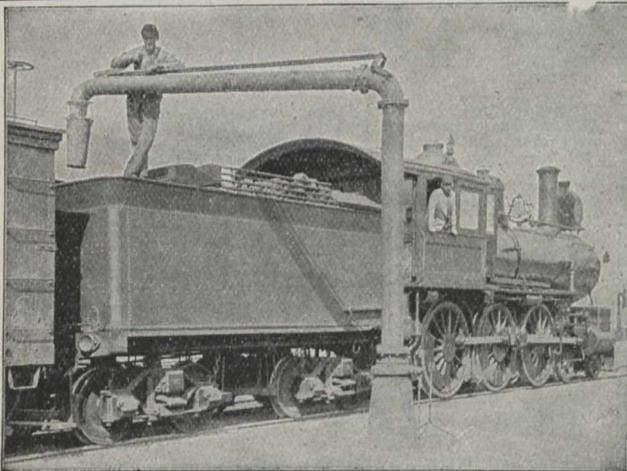


DIAMOND, CRECO, KEWANEE and all types of solid brake beams
More than 5,000,000 now in use
MONITOR BOLSTERS AND "CRECO" ROLLER SIDE BEARINGS
"CRECO SLACK ADJUSTERS"

CANADIAN OFFICE:

22 St. John Street
MONTREAL, QUEBEC

I. A. YOUNG,
AGENT



ONTARIO WIND ENGINE & PUMP CO. LTD., - Toronto and Winnipeg

**MANSFIELD
WATER
COLUMNS**

TANK FIXTURES

WOOD TANKS

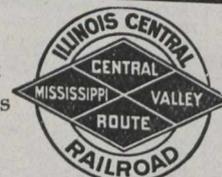
RAILROAD PUMPS

**GASOLINE
ENGINES**

WIND MILLS

HYDRAULIC RAMS

Ticket
Agents



Please
Note

Where ILLINOIS CENTRAL RAILROAD COMPANY has through car service both Coach and Sleeper and Free Chair Cars.

Chicago to Hot Springs, Ark., St. Louis, Omaha, St. Paul and Minneapolis, Memphis, Tenn., New Orleans, San Antonio, Texas and all California.

NEW ORLEANS ROUTE TO THE PACIFIC COAST.

Mardi Gras, New Orleans,
February 1st to 8th, 1910.

Look the Illinois Central map over and consult

G. B. WYLLIE, Canadian Pass'g'r Agent.
305 Ellicott Square, Buffalo, N.Y.

Or F. S. Bishop, G.E.P.A., 333 Broadway,
New York City.

Engineer and Purchasing Agent

alike, are always on the lookout for goods they use, properly constructed, of good material and offered at a fair price.

On enquiry you will find that the ("Safe Lock" Hinge-Stay and "Monarch" Stiff-Stay Woven Fences of all No. 9 wire, will fill these requirements.

Write for Catalogue, samples and other information.

The Owen Sound Wire Fence Co.

OWEN SOUND, ONT. LIMITED

Delaware & Hudson

"The Leading Tourists' Line"

Shortest, Quickest and Best Line between

MONTREAL AND NEW YORK

Through Pullmans

Trains leave Montreal 7.00 p.m. daily, 8.01 p.m. daily, 7.16 a.m. daily, and 10.05 a.m. Sunday.

Perfectly equipped trains. Handsome, large steamers on Lake Champlain and Lake George connect with trains for Saratoga Springs, Albany and New York.

A. A. HEARD, G.P.A., Albany, N.Y.

No. 115. Nov. 23. 300.—Quebec, Gulf of St. Lawrence, Gaspe coast, Grand River, description of light on wharf. 301.—Quebec, Gulf of St. Lawrence, Gaspe coast, Barachois de Malbaie, hand fog-horn at light station. 302.—Quebec, River St. Lawrence, Chat River, range lights established. 303.—Quebec, River St. Lawrence, Father Point, use of explosive fog signals discontinued.

No. 116. Nov. 24. 304.—Nova Scotia, south coast, Sheet rock, hand fog horn at light station. 305.—Nova Scotia, Cape Breton Island, east coast, Flint island, new lighthouse tower, change in character of light.

No. 117. Nov. 29. 306.—Quebec, lower St. Lawrence, off Matane and Ste. Felicite, soundings, currents, warning to mariners.

No. 118.—Nov. 30. 307.—British Columbia, Hecate Strait, Browning entrance, Beaver and Schooner passages, and approach from Hecate Strait, rocks located.

No. 119. Dec. 3. 308.—Nova Scotia, Bay of Fundy, Port George, light improved. 309.—New Brunswick, Shippigan Sound, Petite Lameque bay, buoys established. 310.—Quebec, Gulf of St. Lawrence, Anticosti Island, Bagot Bluff, light improved. 311.—Newfoundland, north end, Cape Bauld, change in appearance and color of lighthouse.

No. 120. Dec. 3. 312.—Quebec, Ottawa River, Lower Allumette Lake, Allumette Island, Supple point, lighthouse established. 313.—Ontario, Ottawa River, Lower Allumette Lake, Spence Island, light pole replaced by tower. 314.—Ontario, Georgian Bay, south side, Collingwood harbor, front range light improved. 315.—Ontario, Lake Huron, north channel, Cockburn Island, Tolsma-ville, light discontinued. 316.—Manitoba, Lake Winnipeg, Gimli, lighthouse established.

No. 121. Dec. 7. 317.—Nova Scotia, Bay of Fundy, Minas Basin, Parrsboro, light improved. 318.—Nova Scotia, Bay of Fundy, Grand Passage, Peter Island, new lighthouse. 319.—Nova Scotia, Cape Breton Island, west coast, Port Hood, character of light.

No. 122. Dec. 15. 320.—British Columbia, Vancouver Island, southeast coast, Esquimalt harbor, electric cable crossing. 321.—British Columbia, Vancouver Island, Scotts Islands, Triangle Island, intended light and wireless telegraph station.

The Future of The Allan Line.

The Montreal Star's London, Eng., correspondent cabled, Dec. 9, in relation to the presence of Sir Thos. G. Shaughnessy, President C.P.R., in England, that it was understood that one object of his visit concerned the completion of arrangements, whereby the C.P.R. was to secure control of the Allan Line, the Glasgow interests of the firm, which held about three-quarters of the working capital, having been purchased with that end in view.

When interviewed in Montreal, Dec. 10, on the subject, Sir H. Montagu Allan, is reported to have said, "It seems perfectly useless to keep on denying these rumors, but there is absolutely no truth whatever in the story. Sir Thos. Shaughnessy's visit to England has nothing whatever to do with the completion of arrangements whereby the C.P.R. secures working control of the Allan Line. The new working arrangement between the two companies is of the most complete and satisfactory character, but everything was arranged before Sir Thos. Shaughnessy left. The control of the Allan Line is now on this side of the ocean, and this has enabled us to make arrangements with the C.P.R., under which we are able to greatly facilitate matters between ourselves and that company."

Grounding of the s s. Athabaska.

An investigation was held at Collingwood, Ont., Nov. 17, 1909, by Capt. L. A. Demers, acting Wreck Commissioner, assisted by Capt. Nash, Montreal, and C. Coles, Collingwood, to enquire into the causes of the grounding of the C.P.R. s.s. Athabaska, Oct. 13, 1909, at Flower Pot Island, near Owen Sound. Following are extracts from the judgment: It was shown that the Athabaska was fully and well equipped with all the necessary instruments for navigation, two good efficient compasses which had been adjusted in the spring, and that the officers all held appropriate certificates.

The Captain, A. Brown, deposed that on Oct. 13, he left Owen Sound for Fort William with general cargo; the weather at the time and up to the casualty was stormy and clear, but, at intervals, a little hazy by snow flurries and rain. It would appear, that after rounding Cove Island and entering Lake Huron, he found the sea so heavy, that he put back, passing again by Cove Island, to get under the lee of Flower Pot Island; that he never lost sight of the Cove Island light and saw the Flower Pot light a minute or so before the ship went ashore, it then becoming obscured. He did not express that his intention was to anchor, but to wait under the lee of Flower Pot Island to see if the weather would become more favorable. When a quarter of a mile or thereabout from Flower Pot Island, a squall came on, which obscured the light and the island partly. The vessel was going half speed, or, about six knots an hour, and shortly afterwards struck on the rocks one ship's length from the lighthouse. It is said that previous to her striking, the Captain ordered the man at the wheel to starboard the helm, but instead the helm was ported, but, the mistake was seen at once and with the help of the second mate, the helm was starboarded, but too late, and, at the same time the telegraph was rung full speed astern to

no avail, the ship remaining fast on the rocks and sustaining serious damages. The second officer and the wheelsman corroborated this.

On the other hand, upon examining the Flower Pot lighthouse keeper, he emphatically stated that; at no time, from half past eight till after the ship stranded, was the light obscured, and, even the light at Cove Island, which is some 12 miles distant, was visible throughout. He remarked that the vessel appeared to be much closer to the island than usual and that he stood at the station watching its movements. Shortly afterwards he saw her coming ashore and grounding. He hailed the vessel, being at a short distance from her, asking if any assistance was required, but, no answer was vouchsafed, although he could see two men on the navigating bridge.

The evidence tended to show that the captain does not seem to understand the workings of the compass, and the only way he assured himself that his compass was correct, was, when in sight of ranges; moreover, he even ignored the name of the maker of the navigating compass, though he had been in command of the vessel for three years. The lead line was not resorted to, in fact it does not appear that the ordinary precautions were taken to avoid apparent dangers. The entries in the scrap log and the official log books, are written in lead pencil, and the Court noticed that, on the day of the mishap, some erasures were made and other observations and notes entered in the official log book. This fact alone, in the Court's view would be sufficient to condemn the master of the vessel, even if proofs of carelessness were wanting. The spelling in the official log book, is execrable. In fact, the way of keeping the logs may be considered as farcical and valueless. After weighing carefully the evidence adduced, the Court is of opinion that the casualty was due to careless navigation on the part of the master, and orders that his certificate be suspended for nine months from Nov. 17, 1909, to Aug. 17, 1910. The other officials are exonerated.

Lake Grain Shipments, 1909 Crop.

The following statement, prepared by F. E. Gibbs, Grain Inspector, Fort William, Ont., shows the bushels of grain shipped from the different elevators at Fort William and Port Arthur, of the 1909 crop, Sept. 1 to close of navigation, Dec. 10, with the ports of destination. The last two figures in each column represent 'lbs.

	WHEAT	OATS	BARLEY	FLAX
CANADIAN PORTS				
Collingwood	240,253.30	99,880.50	98,238.15	.....
Depot Harbor	2,898,788.20	326,605.07	.....	.....
Goderich	3,125,967.40	1,512,716.07	95,717.14	106,605.18
Kingston	3,917,378.30	1,016,544.28	269,584.33	57,419.09
Montreal	2,232,189.00	710,573.00	147,488.44	196,621.35
Midland	845,275.20	421,278.30	35,077.40	.....
Meaford	708,432.50	110,886.16	81,884.18	.....
Owen Sound	1,099,246.20	1,521,494.26	93,049.12	.....
Prescott	2,077.30	.....	.....	.....
Port Colborne	1,565,796.10	344,572.00	34,691.32	.....
Point Edward	1,267,122.10	722,187.27	69,923.08	63,305.50
Port Stanley	76,000.00	45,000.00	.....	.....
Tiffin	8,149,853.40	1,973,382.06	196,493.16	.....
Thorald	195,000.00	.....	.....	.....
Walkerville	172,410.30	206,210.02	.....	.....
Totals	26,405,741.30	9,011,332.09	1,122,148.40	423,952.00
FOREIGN PORTS				
Buffalo	15,082,864.20	482,360.20	305,678.26	1,506,252.13
Erie	110,000.00	.....	255,275.46	85,926.04
Port Huron	1,287,750.20	.....	164,472.42	.....
Totals	42,886,356.10	9,493,692.29	1,847,576.10	2,016,130.17
CANADIAN VESSELS				
FOREIGN VESSELS	29,519,435.40	9,011,331.13	1,396,391.06	543,068.28
Totals	13,366,920.30	482,361.16	451,185.04	1,468,061.45
Totals	42,886,356.10	9,493,692.29	1,847,576.10	2,016,130.17
1908				
CANADIAN VESSELS				
FOREIGN VESSELS	24,530,347.20	3,942,648.16	911,198.16	386,579.25
Totals	11,422,172.00	2,010,553.18	539,665.34	131,334.03
Totals	35,952,519.20	5,953,202.00	1,450,864.02	517,913.28

In addition to the figures quoted above, 1,150 bush. of rye were shipped to Kingston, and 330,639 50 bush. screenings to Chicago and Duluth, against 61,008.50 bush. screenings shipped to the last named ports in 1908. Navigation opened Apr. 14, and closed Dec. 18, 1908, and opened Apr. 28, and closed Dec. 10, 1909.

THE CANADIAN BRIDGE CO., LIMITED

WALKERVILLE, ONTARIO

Manufacturers of

Railway and Highway

BRIDGES

LOCOMOTIVE
TURNTABLES
ROOFS
STEEL BUILDINGS

STRUCTURAL
IRON WORK
OF ALL
DESCRIPTIONS

JAMES THOMSON, J. G. ALLAN, JAMES A. THOMSON, ALEX. L. GARTSHORE,
Pres. and Mang. Director. Vice-President. Secretary. Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.

MANUFACTURERS OF LIMITED



3 Inches to 60 Inches diameter

FLEXIBLE AND FLANGE PIPE AND SPECIAL CASTINGS

FOR WATER, GAS, CULVERT AND SEWER
HAMILTON, ONT.

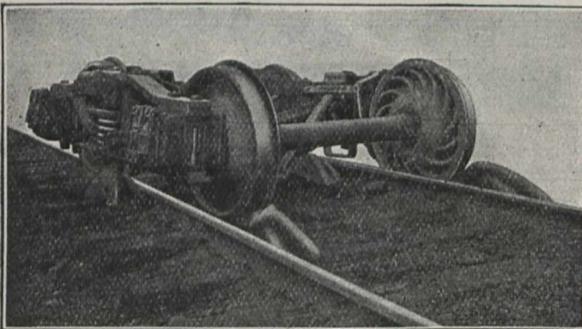
NEW AND RELAYING RAILS

FOR RAILWAYS, TRAMWAYS,
GIRDERS, ETC.

LOCOMOTIVES, CARS AND
OTHER EQUIPMENT.

John J. Gartshore
83 Front Street West - TORONTO

The Alexander Car Replacer



60,000 PAIRS
IN USE.

Manufactured at
Montreal, Que., and
Scranton, Pa.,

of Pressed Steel Plate,
and guaranteed to re-rail
heaviest equipment.

SOLD BY

F. H. HOPKINS & CO. and MUSSENS LIMITED, MONTREAL

Otto Brothers FIELD, B.C. LAGGAN, ALTA.

GUIDES and OUTFITTERS

for the greatest scenic
spot of the world,

The Canadian Rockies

Mountain climbing, exploring, hunt-
ing and fishing parties arranged on
short notice. Reliable men and
horses. References.

EUGENE F. PHILLIPS ELECTRICAL WORKS, Limited

MONTREAL, CANADA

BARE AND INSULATED ELECTRIC WIRE
Electric Light Line Wire, Incandescent and Flexible Cords,
RAILWAY FEEDER AND TROLLEY WIRE

Americanite, Magnet, Office and Annunciator Wires,
Cables for Aerial and Underground Use.

IMPERIAL BANK OF CANADA

Capital Authorized - -	\$10,000,000.00
Capital Paid Up - - -	5,000,000.00
Reserve Fund - - - -	5,000,000.00

HEAD OFFICE - - - - - TORONTO

AGENTS—London, Eng., Lloyds Bank Lim-
ited; New York, Bank of the Manhattan Co.
Sterling exchange bought and sold. Letters
of credit issued available in any part of the
world.

A general Banking business transacted.
Branches throughout the Dominion of
Canada.

SAVINGS DEPARTMENT—Interest allowed on
deposits from date of deposit.

Pending Marine Legislation.

A number of bills affecting the mercantile marine interests are under consideration by the Dominion Parliament. One bill provides for the fixing of a load-line on all vessels registered in Canada of 50 tons gross and over used in inland navigation. Every barge of 100 tons and over proceeding to sea from any Atlantic or Pacific port, as well as from inland ports, shall be similarly marked.

Another bill, provides that every sea-going and coasting passenger vessel over 400 tons gross, and every freight vessel over 1,200 tons gross shall be equipped with wireless telegraph apparatus. The penalty for noncompliance is fixed at not less than \$100 and not exceeding \$1,000 or imprisonment for not exceeding 12 months, or a fine and imprisonment.

Another bill provides for the repeal of sec. 588 of chap. 113 of the revised statutes, which regulates the inspection of vessels, and the substitution of a second of the saloon fittings and their quarter providing that where a vessel holds a certificate of inspection by Lloyds it shall not be required to be inspected by Canadian inspectors the same year.

Another bill affects the inspection of vessels. The first four sections make barges and vessels, not now inspected, subject to inspection; another section provides for the inspection of steam yachts under five tons; section six provides that fishing boats under a certain tonnage shall carry either a life boat, life raft or other appliance for the saving of human life; the last section provides that steamships towing other barges shall be provided with a rocket gun and a heaving line so that a derelict tow may be picked up.

The Minister of Marine has introduced a bill respecting the water carriage of goods. The object is to declare illegal, conditions put in bills of lading by which shipowners can free themselves from any liability arising out of their fault and negligence. The bill was before the Senate two years ago and made the subject of an investigation. It was passed through the Senate last session, but reached the House of Commons too late to be taken up. Other provisions concern losses in case of accidents or force majeure. It also provides that shipowners shall have the right to remove inflammable and explosive goods which may have gone on board without their consent.

Another bill, introduced in the Senate, provides for the protection of navigable waters by prohibiting the deposit of sewage, offal or refuse animal or vegetable matter therein.

Steamer Oscar, Ltd., has been incorporated under the B.C. Companies Act, with a capital of \$8,000, to purchase the steamboat Oscar and the business of the Butler Freighting and Towing Co., Ltd., to acquire steam and other vessels, and carry on a general freighting and carrying business. The Oscar was built at Victoria in 1897, and is a screw driven vessel with engine of 8 n.h.p. Her dimensions are: length, 81 ft.; breadth, 21 ft.; depth, 7 ft.; tonnage, 95 gross.

The A.B.C. Elevator and Wharf Co., Ltd., has been incorporated under the Dominion Companies Act, with a capital of \$3,000,000 and office at Vancouver, B.C., to carry on the businesses of grain growers and buyers, grain elevator and warehousemen, and in connection therewith to build, purchase or otherwise acquire steam and other vessels, to carry on a general transportation business and act as lightermen, stevedores, etc. The provisional directors are: E. H. Heaps, T. H. Worsnop, J. W. Heaps, R. L. Reid, Vancouver, B.C.; L. P. Strong, Calgary, Alta.

Grounding of the s.s. Montezuma.

An investigation into the causes of the grounding of the s.s. Montezuma at Cap a la Roche, Oct. 28, has been held at Montreal, before Capt. L. A. Demers, acting Wreck Commissioner, with Capt. F. Nash and C. Gauthier of the Corporation of Pilots, as assessors. The court found that the pilot was guilty of an error of judgment, but taking in consideration his long and efficient service, reprimanded him and warned him to be more careful in the future. It was also stated that in the court's opinion, the captain forgot for a moment the responsibility with which he is invested, by leaving his post when his vessel was entering one of the most intricate parts of the river, and admonished him to be more careful in the future.

Capt. Walsh, Superintendent C.P.R. steamships, asked to be allowed to place on record his protest against the system adopted by the pilots in taking the wheel themselves, pointing out that it is impossible in vessels of large width, with bridges a great height from the water line, for a person stationed amidships to estimate approximately the distance of an object or buoy from the bow, and in fact such object or buoy actually disappears from the range of visibility of a person so placed, nor can he view any aids to navigation which may be astern, especially in such the case when the wheel is within a wheel house. The court partly agreed that it would be preferable for the pilots to request that the best quartermaster be given them, especially when entering intricate places, so that they would be free to go from one side of the bridge to the other and assure themselves of the exact position and bearing of the various aids to navigation.

Canadian Northern Steamships Ltd.

In our November issue we give full particulars of the incorporation under this title, with a capital of \$2,000,000 and office at Toronto, of another subsidiary company of Mackenzie, Mann & Co. This company will enter the Atlantic steamship service in the spring, and has already acquired three steamships as the nucleus of a fleet. The two principal vessels which have been bought are the Heliopolis and the Cairo, which were built in 1908 at Glasgow, Scotland, for the Egyptian Mail S.S. Co.'s Marseilles-Alexandria service, and have the following dimensions: Length over all, 545 ft.; breadth, 60 ft. 3 in.; depth to shelter deck, 38 ft.; tonnage, 11,000; i.h.p., 18,000. They are fitted with the latest devices for the safety and comfort of passengers, having special regard for the high-class of traffic they were designed to handle. In addition to the features found only on the very latest transatlantic steamers, the Heliopolis and Cairo embody many new ideas in interior fittings, which will give them a quite distinct place when they begin service in the transatlantic trade. There are huge stores, hair-dressers' shops, a dispensary, and ample room for passengers' spare baggage, so arranged that the passengers' access to their baggage is easy. Ventilation is regulated by means of thermo-tanks able to maintain the air at 60 deg. Fahr., with a surrounding atmosphere at zero. In addition to this, the ship has been furnished with scores of little electric exhaust fans. The refrigerating plant for the preservation of provisions is the best that can be got, while the electric light plant is so complete that every stateroom is fitted with ladies' electric curling tongs. To prevent fires a Clayton fire-extinguisher is installed on each of the two steamers and a constant supply of water, salt and fresh, hot and cold, has been laid on all over the vessels. The accommodation for officers and crew is on a scale commensurate with the splen-

dor of the saloon fittings and other quarters provide a measure of comfort that are to be found on but few high-class liners. The machinery consists of three sets of Parsons' compound steam turbines, one h.p. turbine in the centre and two l.p. turbines on either side, having a collective power of 18,000 i.h.p. at 340 shaft revolutions. Vibration and noise have been reduced to a minimum and in spite of the enormous power developed, there is practically no throb or jerk whatever. In their trials they developed a speed of almost 21 knots an hour, and while running between Marseilles and Alexandria they maintained a speed of over 19 knots. Both vessels have been taken to Glasgow, where considerable alterations will be made. They already have splendid first-class accommodation and some second-class and large refrigerator accommodation. The latter feature will be retained; the second-class accommodation will be increased, and third-class accommodation will be provided. The two boats will be renamed.

The Canadian Northern Steamships, Ltd., has also bought the s.s. Volturno, which has been running between Rotterdam, Halifax and New York in the Northwest Transport Line, an enterprise in which Wm. Mackenzie is interested. The Volturno has accommodation for about 65 first-class passengers, 1,300 third-class, and 7,000 tons of freight. She will be placed on the same route as the Heliopolis and Cairo, and another freight boat will probably be bought in the near future. The ports of call have not been decided on, but it is probable that the Canadian ports will be Quebec in summer and Halifax in winter, and that Southampton and Cherbourg will be the European ports.

Capt. G. Gregory, R.N.R., who has been in command of the Heliopolis, was in Toronto recently in consultation with the management. He has been appointed acting Marine Superintendent, with headquarters for the present at the Canadian Northern Ry.'s London, Eng., office. He sailed from New York on the Mauretania, on Dec. 22, and will supervise the changes which are to be made in the boats.

D. D. Mann stated recently that before the C.N.R. line to the Pacific coast is completed the C.N.S. Co. will have a steamship line in operation on the Pacific ocean.

Atlantic and Pacific Ocean Marine.

The Allan Line s.s. Corinthian, in avoiding the running down of a schooner, ran aground on George's Island, near Halifax, N.S., Dec. 19.

The Quebec Steamship Co. has chartered the s.s. Oceana, for service in conjunction with its s.s. Bermudian in the West Indies service, commencing Jan. 15.

The reports for the St. Lawrence navigation season show that there was a falling off of export grain business, as compared with the previous year, of 3,461,678 bush. The total shipments of grain of all kinds were 27,959,396 bush.

A dispatch from Paris, France, states that the Compagnie Transatlantique will operate a special mail steamship line between France and Canada, for which it is to receive an annual subsidy of 3,000,000 francs from France and Canada jointly.

The s.s. Tropea sailed from Sydney, N.S., Dec. 4, 1909, for Prince Rupert, B.C., via Cape Horn, with 6,900 tons of steel rails, supplied by the Dominion Iron and Steel Co., for the G.T.P.R. This is stated to be the largest cargo yet shipped from that port.

The Elder-Dempster Co., is reported to have made an offer to operate eight vessels between St. John, N.B., and Sydney, Australia, in connection with its

DOMINION BUREAU
ROBERT W. HUNT & CO.
ENGINEERS

BUREAU OF INSPECTION
TESTS AND CONSULTATION

Chemical and Cement Laboratories, Montreal
 NORFOLK HOUSE, CANNON ST., LONDON

CHICAGO ST. LOUIS NEW YORK SAN FRANCISCO PITTSBURGH

METEOR WIRE
 FOR
Make and Break
Contact Points
 AND
Spark Points
 IN
Gas & Gasoline Engines
Automobiles

DURABLE NON-CORROSIVE
 ABSOLUTE SUBSTITUTE FOR PLATINUM
 WRITE FOR CATALOGUE

Hermann Boker & Co.
 332 ST. JAMES ST. - - MONTREAL

SOME
INTERESTING
READING

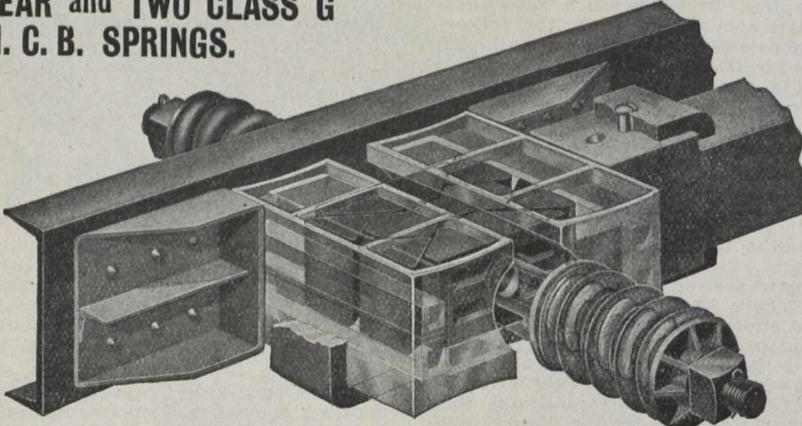
The current issue of "Reactions" has just made its appearance and is brim full of interesting and helpful articles on marine and locomotive repairs. There is also an account of the welding of a 48-ton fly-wheel in the wilds of North Carolina, U.S.A. It illustrates what can be done nowadays when hard pressed for facilities. This paper is sent free of charge and it will be well worth your while to write for a copy.

Goldschmidt Thermit Co.
 103 Richmond St., W., Toronto, Ont.
 General Offices: 90 West Street, New York
 Pacific Coast Branch:
 432-6 Folsom Street, San Francisco

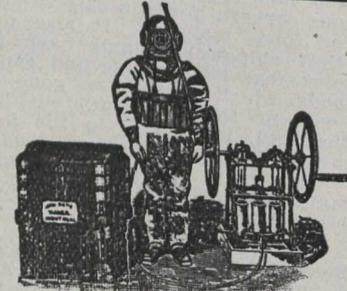
JAMES T. GARDNER
RAILWAY EQUIPMENT
 615 Railway Exchange
CHICAGO, ILL.

Has on hand at all times
First-Class Freight and
Passenger Locomotives
 Also
Contractors' Locomotives
Cars, Rails, Etc.
 Specifications with Prices
 on Application

35 to 1 is the relative amount of work done by **ONE CARDWELL FRICTION DRAFT GEAR and TWO CLASS G' M. C. B. SPRINGS.**



CARDWELL FRICTION DRAFT GEAR—MADE BY
UNION DRAFT GEAR CO., CHICAGO, ILL.



JOHN DATE
 MANUFACTURER OF
DIVING APPARATUS
 FOR SALE OR HIRE
Brass Founder & Coppersmith
 152 Craig St. West, Montreal

<p>SESSIONS-STANDARD Friction Draft Gear Simplest and Best</p>	<p>Both Made by Standard Coupler Co. 2 RECTOR STREET NEW YORK</p>	<p>STANDARD STEEL PLATFORMS Used by all Canadian Railways</p>
---	---	---

present South African fleet of six vessels, making 14 vessels in all, calling at South African ports, in return for a subsidy on the usual basis.

The Steamship Mantinea Co.'s s.s. Mantinea, managed by W. Thomson and Co., St. John, N.B., has been sold to foreign purchasers. The vessel, no. 105,398, registered at St. John, N.B., was built at Glasgow, Scotland, in 1896, and is a screw driven steamer with engine of 250 n.h.p. Her dimensions are: length, 309 ft.; breadth, 42.6 ft.; depth, 23.1 ft.; tonnage, 2,372 gross, 1,737 register.

During the St. Lawrence navigation season of 1909, which was closed Dec. 16, 364 ocean going steamships were inspected at the Grosse Isle quarantine station, against 355 for the 1908 season, and 145,000 passengers from Europe were passed against 105,000. Of these, 553 were detained in quarantine, of which 11 died, against 250 detained, and no deaths for the previous year.

At the recent launching of the G.T.P.R. s.s. Prince Rupert, in England, F. B. Girdlestone of the Bristol Dock Committee, is reported to have said he hoped to have the co-operation of the Great Western Ry. of England and the G.T.R., for the provision of a service of high speed passenger steamers between Bristol and Montreal. He considered it would form the shortest route between London and Montreal.

In answer to a question in the House of Commons, Dec. 7, the Premier said that an application had been received from the Imperial Export Co. for assistance in establishing a fast freight service to Australia and New Zealand from Canada. Communications in regard to the matter had been received from Australia and New Zealand, and papers in connection with the proposal would be laid before the House at an early date. A deputation, which recently waited on the Premier, in this connection, included R. H. Dana, Toronto; W. McMaster, Montreal Rolling Mills Co., Montreal; J. P. McNaughton, Dominion Iron and Steel Co., Sydney, N.S.; J. Near, Guelph, Ont., and H. B. Smith, Owen Sound, Ont. A subsidy of \$250,000 a year was asked for six trips, three to be made from Montreal, and three from St. John or Halifax.

In connection with the future of the C.P.R. Atlantic service, Sir Thos. G. Shaughnessy is reported to have said in England recently:—"There is really nothing to say about the rumors of building new C.P.R. liners for the Atlantic service. We are willing to do our part, the remainder depends on the support that will be given by the Governments. With 21-knot steamers we could make the Atlantic passage in the same time as the Cunard boats, with a 21-knot service we could equal the Lusitania, and with 22-knot boats we could beat her. With the assistance of the two Governments I hope to see such boats, but there are no definite plans final for them as yet. The idea of starting boats from Blacksod Bay, Ireland, does not seem practical. It would cost as much to carry emigrants from Liverpool to Blacksod as we now receive for the entire journey."

Maritime Provinces and Newfoundland.

T. G. Taylor has been appointed Agent for the Marine Department at Charlottetown, P.E.I.

The Dominion Iron and Steel Co., is reported to have decided to order two steamships of about 10,000 tons each, specially designed for the carriage of ore from its mines at Wabana to Sydney.

G. J. Desbarats, Deputy Minister of Marine, Rear-Admiral C. E. Kingsmill, Commander Canadian Fleet, and Col.

Anderson, Chief Engineer, Department of Marine, were reported to have visited Halifax recently, to inspect the dockyard there, with a view to its utilization in connection with the projected naval programme.

The Dominion Government icebreaking steamship Earl Grey received the final touches to her equipment early in Dec., before taking up her service on the Northumberland Straits. She is in charge of Capt. Brown, formerly of the s.s. Stanley, with P. W. Lyon as chief engineer. Her equipment includes a Marconi wireless telegraph installation.

The ferry steamer Halifax was destroyed by fire at Halifax, N.S., Dec. 9. She was formerly known as Annex No. 2, was built at New Baltimore, Mich., in 1878, and was a paddle wheel steamer with engine of 48 n.h.p. Her dimensions were, length, 116.3 ft.; breadth, 30.9 ft.; depth, 11.5 ft.; tonnage, 338 gross, 169 register. She was operated by the Ferry Commission, Dartmouth, N.S., and had recently been renovated. She was valued at \$25,000, and was insured for \$5,000.

Province of Quebec Marine

The Quebec and Levis Ferry Co., is reported to have placed a contract for the construction of two summer boats for its service. It is stated that they are to be ready by May.

The Chairman of the Quebec Harbor Commission was in conference with the Dominion Premier, during Dec., in connection with the proposed improvements in Quebec harbor, a plan of which, on an extensive scale, is being prepared.

The Montreal Harbor Commission's revenue from local, export and import traffic for the season of 1909, was \$350,883, against \$333,123 for 1908. Of the former amount, imports realized \$202,500; exports, \$93,500; local traffic, \$54,883.

The Montreal Harbor Commissioners waited on the Dominion Premier and the Minister of Marine, Dec. 6, to urge the continued co-operation of the Government by way of debenture guarantees to assist them in the carrying out of the plans of extension and betterment arranged for 1910. Assurance was given that the aid would be continued as formerly.

Ontario and the Great Lakes.

The St. Lawrence and Chicago Steam Navigation Co., Ltd., has declared a dividend of 8% for the year 1909.

The Pere Marquette Rd., is reported to have let a contract for the equipment of its car ferry steamboats with wireless telegraph apparatus.

The Richelieu and Ontario Navigation Co., has purchased 9-11 Victoria Sq., Montreal, for use as a city ticket office and general office building.

A press report states that the Richelieu and Ontario Navigation Co. will carry out its proposed operations on the south side of the great lakes, under the name of the International Inland Navigation Co.

The Welland Canal was officially closed for the season, Dec. 15, the steamboat Glen Allen being the last vessel to pass through. It was, however, expected that one or two grain vessels would come down later on.

In reply to a question in the House of Commons, Dec. 2, the Minister of Railways and Canals, said that the cost to the Government, of the break in the Canadian canal at Sault Ste. Marie, in Sept., 1909, was \$867,000.

The Western Dry Dock and Shipbuilding Co., Ltd., is making application to the Governor in Council, for approval of

plans for the construction of a dry dock at Port Arthur, which have been deposited with the Public Works Department, and duplicates at the District Registry, Port Arthur.

A meeting of the Ottawa Board of Trade was held Dec. 13, to consider a memorial to be presented to the Dominion Government emphasizing the prior claims of the Georgian Bay canal scheme over any other possible water route, and asking that the work be commenced at an early date.

The Pennsylvania and Ontario Transportation Co.'s car ferry steamboat Ash-tabula ran ashore at Port Burwell, Ont., Dec. 12, during a storm. The crew were taken ashore safely, after remaining aboard for several days in the hope of being able to get her off by her own power. She was re-floated Dec. 23.

At the annual meeting of the Hamilton Steamboat Co., at Toronto, Dec. 18, the report showed that the past season was a prosperous one. Following are the officers and directors for the current year: President, J. C. Eaton; Vice President, R. Y. Eaton; Secretary Treasurer, J. J. Vaughan; Manager, W. E. Bishop; other directors, H. McGee, C. Booth and A. McCrea.

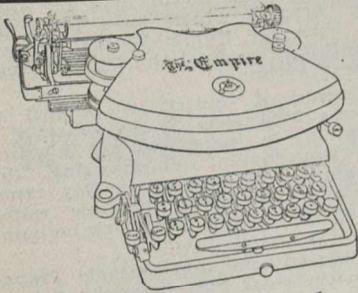
James Richardson and Sons, Ltd., has been incorporated under the Dominion Companies Act, with a capital of \$750,000 and office at Kingston, Ont., to carry on a general elevator and warehouse business, to erect and operate grain elevators, and to own and operate steam and other vessels. The provisional directors are: H. W., J. A., G. T., A. M., A., and K. M. Richardson, Kingston.

The U. S. Lake Survey reports the levels of the Great Lakes for Nov., 1909, in feet above tidewater, as follows: Superior, 602.25; Michigan and Huron, 580.13; Erie, 571.60; Ontario, 245.35. It was anticipated that, during Dec., 1909, Superior would fall 0.3 ft., Michigan and Huron, 0.2 ft.; Erie, 0.1; Ontario, 0.1 ft. Compared with the average Nov. stage for 10 years, Superior was 0.73 ft. below; Michigan and Huron, 0.41 ft. below; Erie, 0.24 ft. below and Ontario, 0.04 ft. below.

Application is being made to the Dominion Parliament to incorporate The International Waterways, Canal and Construction Co. with power to construct a canal from Thunder Bay, on Lake Superior, or from the Pigeon River to the Lake of the Woods, thence to the Red River, or from the Lake of the Woods to the Winnipeg River, and thence by the said river to Lake Winnipeg; thence to Cross Lake, so as to create a navigable waterway to the head waters of the Saskatchewan River, and its branches, together with all subsidiary and necessary powers.

The Marquette and Bessemer Dock and Navigation Co.'s steam car ferry, M. & B. No. 2, was lost, together with the whole of the crew, on Lake Erie, during a storm in the early part of Dec. The ferry operated between Conneaut, Ohio, and Port Stanley, Ont., and had a capacity for 30 loaded cars. It is surmised that the cars broke loose during the storm, causing the vessel to sink immediately. It has not been definitely ascertained as to how many were on board, and only a few of the bodies have been recovered. The M. & B. No. 2, was 2,514 tons gross, 1,484 tons register, her dimensions were, length, 338 ft.; breadth, 54 ft., and she was equipped with triple expansion engines, with cylinders 19, 31 and 52" diam., by 36" stroke. She was built in 1905.

In answer to inquiries in the House of Commons, Dec. 7, in reference to the surveys for the construction of a channel from the Devil's Elbow on Holland River to Bradford station, the Minister of Railways and Canals said: "The Bradford survey was begun on the west branch



**THE
EMPIRE TYPEWRITER**

PRICE \$60.00 ONLY

- Perfect in Construction
- Permanent Alignment
- Hardened Steel Type
- Visible Writing

Made in Canada

BUILT FOR HARD WORK

Will Outlast any Standard Machine made, irrespective of price.

Agents Wanted in every part of Ontario

Communicate Direct with us.

THE WILLIAMS MANUFACTURING CO., LIMITED
P. O. Box 2424 - MONTREAL, P. Q.

FRANKLIN MFG. CO.,

FRANKLIN, PA.

85% Magnesia Locomotive lagging. : : :

Asbestos Pipe Coverings and Asbestos Railway Supplies. : : :

Case hardened corrugated copper and composition gaskets. : : :

Wool Waste

**THE IMPERIAL GUARANTEE
AND
ACCIDENT INSURANCE CO.**

46 King St. West, TORONTO

Capital Subscribed \$1,000,000

ACCIDENT AND SICKNESS Insurance protects your income in case of disablement.

GUARANTEE BONDS protect you against loss from dishonest employees.

Write us if you need a Bond or want an Accident Policy.

GENERAL RAILWAY SIGNAL COMPANY.

ROCHESTER, N.Y.

SIGNALING  INTERLOCKING

CHICAGO
MONANDOCK BLOCK

MONTREAL
EASTERN TOWNSHIPS BANK

NEW YORK
NIGHT & DAY BANK



RAILWAY AND
STEAMSHIP PRINTING

**THE MOST ECONOMICAL AND
SAFEST STAYBOLT ON EARTH**

FOR LOCOMOTIVE, MARINE AND
STATIONARY BOILERS
DOUBLE THE ENDURANCE OF SOLID STAYS

THE SAFETY STAY BOLT



AN AUTOMATIC INSPECTOR

Checks the broken and partly broken staybolts and crown stays. Positively prevents explosions from broken stays. Assists combustion. Years of hard service have proven their safety and economy. We furnish full length Hollow Staybolt Bars in the rough, averaging from 8 to 10 ft. long, any size, O.D. & I.D. We also make solid staybolt bars of the best double refined charcoal iron. Average length, 16 to 20 ft.

FALLS HOLLOW STAYBOLT CO., CUYAHOGA FALLS, OHIO
Representatives Dominion of Canada: Brydges Engineering and Supply Co.,
Winnipeg, Canada; Mussels Limited, Montreal, Canada.

STEEL, PEECH & TOZER

Limited,
SHEFFIELD, ENGLAND.

STEEL AXLES, TYRES, AND
SPRING STEEL

"PHENIX" Loco. Spring Steel is
the accepted Standard in Canada

Sole Agents:
James Hutton & Co., Montreal

THE CANADIAN RAILWAY ACCIDENT INSURANCE COMPANY, OTTAWA, CANADA

A PURELY CANADIAN COMPANY
H. W. PEARSON, Secretary-Treasurer
SUBSCRIBED CAPITAL - \$200,000.
AUTHORIZED CAPITAL - \$500,000.

JOHN EMO, General Manager
Issues all classes of Accident and Sickness Insurance at lowest rates as is consistent with safety.

Agents wanted in unrepresented districts.

D. MURPHY, President
Railroad Employees and Collective Insurance a specialty.

of Holland river at the junction of the Newmarket canal, 4.9 miles from Cook's bay, and carried up the west branch of the river to about 3 miles above the Bradford and Holland Landing road. The channel leading to the proposed basin in front of the G.T.R. station, Bradford, would leave the west branch at the Devil's Elbow, 7 miles from Cook's bay, and the Bradford basin would be at 8.2 miles, or in other words the canal would be 1.2 miles long with a bottom width of 50 ft. The proposed Bradford basin is estimated for 200 ft. width, enclosed with concrete dock walls. No work is required in the 2.1 miles of river between the junction of the Newmarket canal and the Devil's Elbow. The estimated cost is \$52,947."

Manitoba, Saskatchewan and Alberta.

The Winnipeg Fish Co., Ltd., has been incorporated under the Manitoba Companies Act, with a capital of \$40,000, and office at Winnipeg, to carry on a general fishing business, and in connection therewith to own and operate steam and other vessels, and when same are not required for the carrying of the company's produce, to carry freight and passengers for hire. The provisional directors are: G. E. Richards, R. G. Affleck, J. Allen, W. P. Fillmore, Winnipeg, and T. J. Jones, Selkirk, Man.

The International Waterways Canal and Construction Co. is applying to the Dominion Parliament for incorporation, to construct a canal from Thunder Bay, Lake Superior, or from Pigeon River, to the Lake of the Woods, thence to the Red River, or from the Lake of the Woods to the Winnipeg River and thence to Lake Winnipeg, and on to Cross Lake, and so create a navigable waterway to the headwaters of the Saskatchewan River and its branches. Among other powers desired are: the erection of telegraph and telephone lines, electrical transmission lines, the carrying on of a general forwarding and manufacturing business, and for such purposes to exercise all the powers and rights as granted by the Railway Act, with power to amalgamate with other companies. Smith and Johnston, Ottawa, are solicitors for applicants.

B.C. and Pacific Coast Marine.

A report from Victoria states that debentures for \$2,000,000 are being placed in England for the purpose of building a floating dock at Esquimalt.

Capt. J. W. Troup, Manager C.P.R. Pacific Coast Service, sailed from St. John, N.B., Dec. 4 on the s.s. Empress of Britain for Great Britain, where he will make arrangements for the construction of two vessels for the Pacific coast trade.

A stern wheel steamboat named Helen M. Scanlon was recently constructed at Vancouver for the Brooks-Scanlon Lumber Co., and is at Victoria having her machinery installed. She will be used for logging work on the Fraser River and Harrison Lake.

The G.T.P.R. is asking for tenders for the construction of wharves at Victoria, at an approximate cost of \$100,000. It is also reported that the company has leased the Flyer dock, Seattle, Wash., and that it will erect a large pier there at a cost of \$250,000.

The G.T.P.R. s.s. Prince Rupert was launched at Wallsend-on-Tyne, Eng., Dec. 19. This is the first of the company's vessels to be built for the Pacific Coast service. On completion, she will be sent to Prince Rupert, by way of Cape Horn, and it is anticipated, will be placed in service in the spring. A second vessel to be named Prince George is under construction.

The International Steamship Co., Victoria, is reported to have under consideration plans for the construction of a twin screw vessel to be named Sioux, which it proposes to have ready for service, either between Victoria and Seattle or Vancouver and Seattle, early in 1911. The plans provide for a vessel 215 ft. long, 36 ft. beam, and engines of 3,500 h.p. for a maximum speed of 20 knots an hour, with accommodation for about 1,500 passengers.

Steamer Forager, Ltd., has been incorporated under the B.C. Companies

APPLICATION TO PARLIAMENT

Notice is hereby given that application will be made to the Legislative Assembly of the Province of Ontario at its next session for an Act incorporating the Wahnapiatae Railway Company, with power to construct a line of railway from a point on the line of the Canadian Northern Ontario Railway Company, in the Township of Hutton or Creelman, thence in a generally northerly direction, passing near Burwash and Welcome Lakes, to a point on the Wahnapiatae River above the outlet from Welcome Lake, such line traversing one or both of the said Townships of Hutton and Creelman and unsurveyed territory in the District of Nipissing to the north, and also fixing the limit of securities which may be issued in respect of such line, and authorizing agreements for sale or amalgamation with other Companies, and with other usual and customary powers.

GERARD RUEL,
Solicitor for the Applicants,

NOTICE is hereby given that the Grand Trunk Pacific Branch Lines Company will apply to the Parliament of Canada, at its present session, for an Act further amending the Act incorporating the Company, chapter 99 of the statutes of 1906, as amended by chapter 86 of the statutes of 1909, by authorizing the construction of the following additional lines of railway:—

(1) From a point on the Western Division of the Grand Trunk Pacific Railway between the east limit of Range 12 and the west limit of Range 17, west of the third meridian, thence in a southwesterly and westerly direction to a point in the vicinity of Calgary, or to a point on the line which the Company is authorized, under paragraph 14 of clause 11 of said chapter 99, to construct to Calgary;

(2) From a point on the proposed line mentioned in paragraph (1) between the east limit of Range 20 and the west limit of Range 28, west of the third meridian, thence in an easterly and southeasterly direction to Regina or to a point in the vicinity thereof;

(3) From a point on the proposed line mentioned in paragraph (2) between the east limit of Range 24 and the west limit of Range 27, west of the Second Meridian, to Moose Jaw, or to a point in the vicinity thereof;

(4) From a point on the Western Division of the Grand Trunk Pacific Railway between Arland and Wainwright, thence in an easterly and southeasterly direction to a point on the line which the Company is authorized, under paragraph 13 of clause 11 of said chapter 99, to construct to Battleford;

(5) From Regina, or a point in the vicinity thereof, thence in a southwesterly and westerly direction to Lethbridge, or to a point in the vicinity of Lethbridge on the line which the Company is, under paragraph 14 of clause 11 of said chapter 99, authorized to construct from Calgary to the southern boundary of the Province of Alberta at or near Coultts.

(6) From a point on the main line of the Western Division between Moose Lake and Tete Jaune Cache, thence

through the drainage of the Clearwater River, Bonaparte River, Seton and Anderson Lakes, and the Lilloet River or the Squamish River, or between the last two rivers, to Vancouver, British Columbia; authorizing an issue of bonds to the extent of \$30,000.00 a mile of the said lines of railway, numbered (1) to (5) inclusive and comprising the said lines within what are defined by the said Act as the "Manitoba, Saskatchewan and Alberta Extensions"; authorizing an issue of bonds to the extent of \$50,000.00 a mile of the said line of railway numbered (6), and comprising the said line within what is defined by the said Act as the "British Columbia extensions"; and also amending paragraph 11 of clause 11 of the said Act, as regards the southern terminus of the line thereby authorized.

Dated at Montreal this 29th day of November, 1909.

W. H. BIGGAR,
Solicitor for Applicants.

ESTABLISHED 1849
BRADSTREET'S
Capital and Surplus \$1,500,000
Offices throughout the Civilized World
Executive Offices:
NOS. 346 and 348 BROADWAY, N. Y.
CITY, U. S. A.

The Bradstreet Company gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying and promulgating information, no effort is spared, and no reasonable expense considered too great, that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished, and are available only by reputable wholesale, jobbing and manufacturing concerns, and by responsible and worthy financial, fiduciary and business corporations. Specific terms may be obtained by addressing the Company at any of its offices.

Correspondence Invited.
OFFICES IN CANADA:
Halifax, N.S.; Hamilton, Ont.; London, Ont.; Montreal, Que.; Ottawa, Ont.; Quebec, Que.; St. John, N.B.; Toronto, Ont.; Vancouver, B.C.; Calgary, Alta.; Winnipeg, Man.

THOS. C. IRVING,
Gen. Man. Western Canada, Toronto.

LEGG BROS.
ENGRAVING CO.

MAKERS OF FINE 1/2 TONES
OF LINE ENGRAVINGS
WOOD CUTS ELECTROS

DESIGNERS, ILLUSTRATORS
FINE CATALOGUE MAKERS

PRICE LOW QUALITY HIGH

PHONE MAIN 5003. No. 5 JORDAN ST.
TORONTO

PROVINCIAL STEEL CO., LTD.

COBOURG, ONT.



LOCOMOTIVES

FOR ALL CLASSES OF SERVICE

VULCAN IRON WORKS

WILKES-BARRE, PA., U.S.A.

Canadian Representatives - MUSSENS LIMITED, MONTREAL

Largest Dealers Rebuilt Equipment in United States

TWO SEPARATE PLANTS

EAST PLANT

Capacity, 25 New Freight Cars per day
10 New Coaches per month

WEST PLANT

Capacity, 10 Heavy Repairs Locomotives per month
Besides Coach and Freight Car Repairs

PROMPT DELIVERY—New Passenger and Freight Equipment—Rebuilt Locomotives, Passenger and Freight Equipment

HICKS LOCOMOTIVE AND CAR WORKS, = = Chicago, Ill.

CRUCIBLE SAW AND SHEET STEEL

MADE BY

JESSOP STEEL CO.

Washington Pa., U.S.A.

TOOL STEEL

The old reliable Jessop Steel.
The very best for making all
kinds of Tools.

Jessop's "Ark" High Speed Air Hardening Steel

is unexcelled for turning Loco-
motive Tires, Shafting and
Car Wheels, or for planing
castings.

WILLIAM JESSOP & SONS, Limited, SHEFFIELD, ENG.
CHAS. L. BAILEY, Agent, 80 BAY STREET, TORONTO, ONTARIO

Schools of the Sisters of the Church (ANGLICAN)

36 Walmer Road, Toronto
330 Kent St., Ottawa

VISITORS: The Lord Bishop of
Toronto and the Lord Bishop
of Ottawa.

Boarding and Day School for
Girls. Kindergarten, Primary,
Secondary and Collegiate De-
partments. Preparation for Ma-
triculation. Next School year
will begin Thursday Sept. 9th.
Apply to

Sister in Charge.

WIRE ROPE

"ACME" BRAND



Highest grade of hoisting rope made.

Extra tensile strength for heavy work.

Use Greening's Rope Grease for Lubrication

THE B. GREENING WIRE CO., Limited

HAMILTON, ONT.

MONTREAL, QUE.

CARS

NEW and REBUILT

Box, Flat, Gondola and Tank

Steam Shovels, Rails, Locomotives
and Contractors' Equipment

Immediate and Prompt Deliveries
Correspondence Solicited

ROBT. M. BURNS & CO.

Railway Exchange
CHICAGO

Act, with a capital of \$8,000, to purchase the steamboat Forager and the business carried on therewith, by the Butler Freighting and Towing Co., Ltd., to acquire steam and other vessels, and carry on a general freighting and carrying business. The Forager was built at Victoria in 1904, and is a screw driven vessel with engine of 13 n.h.p. Her dimensions are: length, 84 ft.; breadth, 18.8 ft.; depth, 6.6 ft.; tonnage, 90 gross, 57 net.

The New Columbia River Lumber Co., Ltd., has been incorporated under the B.C. Companies Act, with a capital of \$5,000,000 to carry on the general business of lumbermen, and in connection therewith to own and operate steam tugs and vessels of all descriptions.

Capt. C. H. Nicholson, heretofore Traffic Manager Northern Navigation Co., Sarnia, Ont., has been appointed Manager G.T.P.R. Pacific Coast Steamship Lines, with headquarters at Vancouver. He will have supervision of all matters pertaining to the company's marine and steamship business on the Pacific coast, the operation and maintenance of steamers, docks, etc., and such other duties as may be assigned to him.

A vessel is under construction at New Westminster for Anglican Church mission work in Northern British Columbia and along the Pacific coast. The dimensions of the vessel are given as: length, 100 ft.; breadth, 17 ft.; depth, 10 ft. It is being built of fir, with oak ribs and oak stern post, and will be equipped with two gasoline engines of 100 n.h.p. each, and carrying a small gasoline launch. It will be steam heated and lighted by electricity, and fitted up with all the requirements of a modern hospital.

We are advised that the contract which the Dominion Government has entered into with the G.T.P.R., for a steamboat service on the Pacific coast, calls for a fortnightly service from Nov. 1 to Mar. 31, and a weekly service from Apr. 1 to Oct. 31, each year, and that it expires Mar. 31, 1915. For this service, the G.T.P.R. has chartered Mackenzie Bros.' s.s. Henriette, which it hopes to replace by one of its own vessels about March. The Henriette, which was formerly a sailing vessel, has an engine of 32 n.h.p. driving a screw. Her dimensions are: length, 160 ft.; breadth, 30 ft.; depth, 18 ft. 9 ins.; tonnage, 763 gross, 518 net.

SAULT STE. MARIE CANALS TRAFFIC.

The following commerce passed through the Sault Ste. Marie Canals during 1909 :

ARTICLES.	CANADIAN CANAL	U. S. CANAL	TOTAL
Copper.....Eastbound.....Net tons	8,823	118,889	127,212
Grain.....".....Bushels	28,528,222	17,984,646	46,512,868
Building stone.....".....Net tons		1,784	1,784
Flour.....".....Barrels	2,508,392	4,580,473	7,088,865
Iron ore.....".....Net tons	21,128,194	18,866,499	39,994,693
Pig iron....."....."	4,414	36,240	40,654
Lumber.....".....M. ft. B.M.	34,686	517,694	552,380
Wheat.....".....Bushels	74,814,845	38,438,716	113,253,561
General merchandise.....".....Net tons	65,060	98,099	163,159
Passengers.....".....Number	14,751	15,126	29,877
Coal, hard.....Westbound.....Net tons	351,634	1,060,753	1,412,387
Coal, soft....."....."	2,377,099	6,150,540	8,527,639
Flour.....".....Barrels	4,950	360	5,310
Grain.....".....Bushels	833	5,750	6,583
Manufactured iron.....".....Net tons	154,408	327,219	481,627
Iron ore....."....."	20,285		20,285
Salt.....".....Barrels	201,114	449,977	651,091
General merchandise.....".....Net tons	479,720	497,465	977,185
Passengers.....".....Number	17,461	12,610	30,071
Vessel passages.....Number	6,401	12,803	19,204
Registered tonnage.....Net	17,812,254	28,939,463	46,751,717
Freight—Eastbound.....Net tons	24,350,318	22,028,768	46,379,086
—Westbound....."	3,412,457	8,103,603	11,516,063
Total freight....."	27,762,775	30,132,374	57,895,149

COMPARATIVE STATEMENT FOR THE SEASONS OF 1908 AND 1909.

ITEMS.	1908	1909
Vessels :		
Steamers.....Number	12,553	16,463
Sailing....."	1,355	1,787
Unregistered....."	1,273	954
Total....."	15,181	19,204
Lockages....."	10,685	13,571
Tonnage, Registered.....Net	31,091,730	46,751,717
Freight....."	41,390,557	57,895,149
Passengers.....Number	53,287	59,948
Coal, hard.....Net tons	1,384,743	1,412,387
soft....."	8,517,717	8,527,639
Flour.....Barrels	5,704,375	7,094,175
Grain.....Bushels	103,041,873	113,253,561
Manufactured and Pig Iron.....Net tons	43,458,588	46,519,451
Salt....."	289,308	522,281
Copper.....Barrels	547,223	651,091
Iron Ore.....Net tons	101,735	127,212
Lumber.....M. ft. B. M.	24,650,340	40,014,978
Building Stone....."	453,761	552,380
General Merchandise.....Net tons	1,019	1,784
	842,901	1,140,344

The U. S. canal was opened Apr. 20, and closed Dec. 11, 1909; season, 236 days.

The Canadian canal was opened Apr. 21, and closed Dec. 16, 1909; season, 240 days.

The Purchasing Agents' Guide

To the Manufacturers of and Dealers in Steam and Electric Railway, Marine, Grain Elevator, Express, Telegraph Telephone and Contractors' Supplies, &c.

- Aerated Waters**
E. L. Drewry Winnipeg.
- Air Brakes and Fittings**
Allis-Chalmers-Bullock Ltd. Montreal.
Canadian Westinghouse Co. Hamilton, Ont.
- Ales**
E. L. Drewry.....Winnipeg.
- Angle Bars**
Hamilton Steel & Iron Co. Hamilton, Ont.
Montreal Rolling Mills Co. Montreal.
Nova Scotia S. & C. Co., New Glasgow, N.S.
- Anti Rall Creepers**
The Holden Co., Ltd. Montreal.
- Axes**
Hamilton Steel & Iron Co. Hamilton, Ont.
James Smart Mfg. Co. Brockville, Ont.
- Axles**
James Hutton & Co. Montreal.
Nova Scotia S. & C. Co., New Glasgow, N.S.
Jas. W. Pyke & Co. Montreal.
Rhodes, Curry Co., Ltd. Amherst, N.S.
- Beacons**
International Marine Signal Co. Ottawa.
- Bearings, Side**
Chicago Railway Equipment Co. Chicago.
Dominion Car and Foundry Co. Montreal.
Union Draft Gear Co. Chicago, Ill.

- Blankets and Bedding**
The Hudson Bay Co.
- Boilers**
Babcock & Wilcox, Ltd. Montreal.
Polson Iron Works, Ltd. Toronto.
Robb Engineering Co., Ltd. Amherst, N.S.
- Boilers, Portable**
Babcock & Wilcox, Ltd. Montreal.
Polson Iron Works, Ltd. Toronto.
Robb Engineering Co., Ltd. Amherst, N.S.
- Boilers, Stationary and Marine**
Babcock & Wilcox, Ltd. Montreal.
I. Matheson & Co. New Glasgow, N.S.
Polson Iron Works, Ltd. Toronto.
Robb Engineering Co., Ltd. Amherst, N.S.
- Boller Staybolt Iron or Steel Bars**
Falls Hollow Staybolt Co. Cuyahoga Falls.
- Boilers, Steam**
Babcock & Wilcox, Ltd. Montreal.
Polson Iron Works, Ltd. Toronto.
Robb Engineering Co., Ltd. Amherst, N.S.
- Boilers, Water Tube**
Babcock & Wilcox, Ltd. Montreal.
Polson Iron Works, Ltd. Toronto.
Robb Engineering Co., Ltd. Amherst, N.S.

- Bolsters**
Dominion Car and Foundry Co. Montreal.
- Bolts, Bridge**
Montreal Rolling Mills Co. Montreal.
Toronto Bolt and Forging Co. Toronto.
- Bolts, Carriage and Machine**
Toronto Bolt and Forging Co. Toronto.
- Bolts, Track**
Montreal Rolling Mills Co. Montreal.
Nova Scotia S. & C. Co., New Glasgow, N.S.
Toronto Bolt and Forging Co. Toronto.
- Books**
Engineering News Book Dept. New York.
Renouf Publishing Co. Montreal.
- Borers, Car Wheel**
John Bertram & Sons Co. Dundas, Ont.
- Braces, Cross Arm**
Montreal Rolling Mills Co. Montreal.
Toronto Bolt and Forging Co. Toronto.
- Brake Beams**
Chicago Railway Equipment Co. Chicago.
Dominion Car and Foundry Co. Montreal.
- Brake Shoes**
Am. Brake Shoe & F'dry Co. Mahwah, N.J.
Canada Iron Corporation, Ltd. Montreal.
The Holden Co., Ltd. Montreal.

JOHN S. METCALF CO.
 ENGINEERS AND CONTRACTORS FOR
GRAIN ELEVATORS ONLY
 CONCRETE—STEEL—WOOD
 Plans and Specifications our Specialty
 MONTREAL, QUE. CHICAGO, ILL.

REAMERS ALL KINDS OF REAMERS FOR RAIL-ROAD SHOPS AND BRIDGE BUILDING



BUTTERFIELD & CO., ROCK ISLAND, QUE.
 HAND, MACHINE AND TAPPER TAPS, STAY BOLT TAPS, BOILER AND PATCH BOLT TAPS. QUALITY UNSURPASSED.

NICKEL
 THE CANADIAN COPPER COMPANY
NICKEL FOR NICKEL STEEL
 THE ORFORD COPPER COMPANY
 WRITE US FOR PARTICULARS AND PRICES
 General Offices: 43 Exchange Place, NEW YORK

HEADLIGHTS-WE MAKE THEM



For OIL, for Pyle ELECTRIC equipment or SPECIAL to Blue Print, and carry a large stock of standard headlight reflectors, burners, burner parts, felt wicks and chimneys.
The HIRAM L. PIPER CO., Limited
 17 to 23 Normand Street, Montreal.
 Get our No. 30 Catalogue. (Between St. Peter and McGill Sts.)

THE CANADIAN BRONZE COMPANY, LTD.
 Brass Wearing Parts for Locomotives.
 Journal Bearings for Freight and Passenger Service.
 BABBITTS. Miscellaneous Brass Castings for Railroads.
 Works and Office: 69 DELORIMIER AVENUE, MONTREAL, QUE.

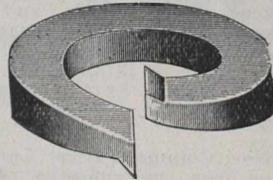
DUNER CAR CLOSET
 ENAMELED IRON WET DRY CLOSET
 DUNER CO.
 118 SO. CANTON ST., CHICAGO

CRANES HOISTS

NORTHERN CRANES
 NORTHERN ENGINEERING WORKS
 DETROIT, MICH., U.S.A.

Established 1887
MILLER CHEMICAL ENGINE CO.
 FIRE APPLIANCES
 In use by nearly all the Railroads
 U.S. and Canada
 Chicago, U.S.A - 220-222 W. Huron St.

THE POSITIVE LOCK WASHER
 Is the BEST Nut LOCK for all purposes



We also make plain coils and tail nut locks.
The Positive Lock Washer Co.
 Sole Mfrs., Newark, N.J.
 F.H. HOPKINS & CO., Agts., Montreal

UNIFORM CAPS
 For officials and employes of Railway, Steamship, Express, Telegraph and other companies, Yacht Clubs, Etc. Helmets and Uniform Caps for Police, Firemen, Bands, Societies, Etc. Embroidery in Gold and Silver Bullion.
W. H. CODDINGTON
 HAMILTON, - ONTARIO

LEHIGH VALLEY RAILROAD
 BEST LINE FROM TORONTO AND ONTARIO POINTS
 - TO -
 NEW YORK, PHILADELPHIA AND SOUTH
 For particulars, write to or call on
MR. ROBERT S. LEWIS
 Canadian Passenger Agent
 54 King St. East - - - - Toronto

NIAGARA NAVIGATION CO., LIMITED
 Notice is hereby given that a dividend of four per cent., being at the rate of eight per cent. for the year, has been declared upon the capital stock of this Company, and the same will be payable on the 3rd January, 1910.
 The transfer books will be closed from the 17th of December to the 31st of December, 1909, both days inclusive.
 The annual meeting of the shareholders will be held on Tuesday, the 11th of January, 1910, at 12 o'clock noon, at the head office of the Company, Room 910, Traders Bank Building, Toronto.
B. W. FOLGER,
 General Manager.
 Toronto, December 10, 1909.

Standard Paint & Varnish Co. Limited
Makers of High Grade
Varnishes, Japans,
Paints, Colors & Enamels.
Windsor Ont.

FOR TICKET CASES AND COMMERCIAL FURNITURE
 of all descriptions to stock or special design, apply to
The Canadian Office & School Furniture
 Preston Co. Limited Ontario

Brake Shoes, Electric Ry.
Am. Brake Shoe & F'dry Co. Mahwah, N.J.

Brake Shoes, Locomotive Driver
Am. Brake Shoe & F'dry Co. Mahwah, N.J.

Canada Iron Corporation, Ltd. Montreal.

Brass and Copper Cloth
The B. Greening Wire Co. Hamilton, Ont.

Brasses, Car
T. McAvity & Sons St. John, N.B.

Bridge Numbers
Acton Burrows, Limited Toronto.

Bridges
Canadian Bridge Co. Walkerville, Ont.
Dominion Bridge Co. Montreal.

Bronze
American Vanadium Co. Pittsburg, Pa.

Buckets, Coal, Ore and Concrete
M. Beatty & Sons, Ltd. Welland, Ont.
Brown Hoisting Machinery Co. Cleveland.

Buildings, Steel
Canadian Bridge Co. Walkerville, Ont.
Dominion Bridge Co. Montreal.

Bumping Posts
Dominion Equip't & Supply Co., Winnipeg.
The Holden Co., Ltd. Montreal.
McCord & Co. Chicago, Ill.

Buoy Lighting
Safety Car Heat. & Light. Co. New York.

Buoys
International Marine Signal Co. Ottawa.

Cables, Electric and Feeder
E. F. Phillips Electrical Works. Montreal.
The Wire and Cable Co. Montreal.

Caps, Uniform
W. H. Coddington Hamilton, Ont.

Car Loaders, Box
Mussens, Ltd. Montreal.

Car Movers
F. H. Hopkins & Co. Montreal.
Mussens Limited. Montreal.

Cars
American Car & Equipment Co. Chicago.
R. M. Burns & Co. Chicago, Ill.
Canada Car Co., Ltd. Montreal.
Crossen Car Mfg. Co. Cobourg, Ont.
Dominion Car and Foundry Co. Montreal.
J. T. Gardner. Chicago, Ill.
Hart-Otis Car Co., Ltd. Montreal.
Hicks Locomotive and Car Works. Chicago.
Ottawa Car Co., Ltd. Ottawa.
Preston Car and Coach Co., Ltd. Preston.
Rhodes, Curry Co., Ltd. Amherst, N.S.
Russell Wheel & Fdry. Co., Detroit, Mich.
Silliker Car Co., Ltd. Halifax, N.S.

Cars, Logging
Russell Wheel & Fdry. Co., Detroit, Mich.

Castings
American Vanadium Co. Pittsburg, Pa.
Crossen Car Mfg. Co. Cobourg, Ont.
I. Matheson & Co. New Glasgow, N.S.
Russell Wheel & Fdry. Co., Detroit, Mich.
Standard Steel Works Co. Philadelphia, Pa.

Castings, Brass
Canadian Bronze Co. Montreal.
Canada Iron Corporation, Ltd. Montreal.
Kerr Engine Co. Walkerville, Ont.
I. Matheson & Co. New Glasgow, N.S.
Tallman Brass & Metal Co., Ltd. Hamilton.

Castings, Car
American Brake Shoe & Fdry Co. Mahwah.
Canada Iron Corporation, Ltd. Montreal.
Russell Wheel & Fdry. Co., Detroit, Mich.

Castings, Iron
Allis-Chalmers-Bullock Ltd. Montreal.
Canada Car Co., Ltd. Montreal.
Canada Iron Corporation, Ltd. Montreal.
Kerr Engine Co. Walkerville, Ont.
Russell Wheel & Fdry. Co., Detroit, Mich.

Castings, Iron and Steel
American Brake Shoe & F'dry Co. Mahwah.

Castings, Malleable
Taylor & Arnold. Montreal.

Castings, Manganese Steel
Montreal Steel Works, Ltd. Montreal.

Castings, Steel
Canada Iron Corporation, Ltd. Montreal.
Montreal Steel Works. Montreal.
Rhodes, Curry Co., Ltd. Amherst, N.S.
American Vanadium Co. Pittsburg, Pa.

Chains
B. J. Coghlin & Co. Montreal.

Closets, Car
Duner Co. Chicago, Ill.

Coal
Nova Scotia S. & C. Co., New Glasgow, N.S.

Compressors, Air
Allis-Chalmers-Bullock Ltd. Montreal.
Canadian Rand Co. Montreal.

Concrete Mixers and Rock Crushers
F. H. Hopkins & Co. Montreal.
Mussens Limited. Montreal.
Toronto Pressed Steel Co. Toronto.

Contractors' Supplies
F. H. Hopkins & Co. Montreal.
Rice Lewis & Son. Toronto.
Russell Wheel & Fdry. Co., Detroit, Mich.
Toronto Pressed Steel Co. Toronto.

Conveyors, Coal and Ash
Babcock & Wilcox, Ltd. Montreal.

Copying Presses
James Smart Mfg. Co. Brockville, Ont.

Couplers, Car and Locomotive
Dominion Car and Foundry Co. Montreal.
McConway & Torley Co. Pittsburgh, Pa.

Montreal Steel Works, Limited. Montreal.
Taylor & Arnold. Montreal.

Cranes
Brown Hoisting Machinery Co. Cleveland.
Northern Engineering Works, Detroit, Mich.

Cranes, Electric
Babcock & Wilcox. Montreal.
Dominion Bridge Co. Montreal.
Mussens Limited. Montreal.

Cranes, Locomotive
American Hoist and Derrick Co. St. Paul.

Cranes, Wrecking
Mussens Limited. Montreal.

Crowbars
B. J. Coghlin & Co. Montreal.
Toronto Bolt and Forging Co. Toronto.

Curtains and Fixtures, Car
The Holden Co., Ltd. Montreal.

Cuts
Acton Burrows, Limited. Toronto.

Cylinders
American Vanadium Co. Pittsburg, Pa.

Derailing Devices
General Railway Signal Co., Rochester, N.Y.

Derricks
American Hoist and Derrick Co. St. Paul.
M. Beatty & Sons. Welland, Ont.
Mussens Limited. Montreal.

Dies
Butterfield & Co. Rock Island, Que.
A. B. Jardine & Co. Hespeler, Ont.

Ditchers
M. Beatty & Sons. Welland, Ont.

Diving Outfits
John Date. Montreal.
Mussens Limited. Montreal.

Doors, Steel Rolling
Mussens Limited. Montreal.

Door Signs
Acton Burrows Limited. Toronto.

Draft Gear
Farlow Draft Gear Co. Baltimore, Md.
The Holden Co., Ltd. Montreal.
McCord & Co. Chicago, Ill.
Standard Coupler Co. New York City.
Union Draft Gear Co. Chicago, Ill.
Waugh Draft Gear Co. Chicago, Ill.

Draughtsmen's Supplies
John A. Hart & Co. Winnipeg.

Dredges
M. Beatty & Sons. Welland, Ont.
Polson Iron Works, Ltd. Toronto.

Drills, Air
Canadian Rand Co. Montreal.

Dry Goods
The Hudson's Bay Co.

Dump Cars (Contractors')
Dominion Equip't & Supply Co., Winnipeg.
F. H. Hopkins & Co. Montreal.

Dump Cars, Hand
Meaford Wheelbarrow Co., Ltd. Meaford.

Dynamos
Northern Electric & Mfg. Co., Ltd. Montreal.

Dynamo and Electric Castings
American Brake Shoe & F'dry Co. Mahwah.

Economizers
Babcock & Wilcox (Ltd.) Montreal.

Electric Car Route Signs
Acton Burrows Limited. Toronto.

Electric Apparatus
Allis-Chalmers-Bullock Ltd. Montreal.
Northern Electric & Mfg. Co., Ltd. Montreal.

Electric Light Plant
Allis-Chalmers-Bullock Ltd. Montreal.

Elevators, Grain
John S. Metcalf Co. Chicago, Ill.

Enameled Iron Signs
Acton Burrows Limited. Toronto.

Engines, Automatic
Robb Engineering Co., Ltd. Amherst, N.S.
Polson Iron Works, Ltd. Toronto.
Russell Wheel & Fdry. Co., Detroit, Mich.

Engines, Corliss
Robb Engineering Co., Ltd. Amherst, N.S.
Allis-Chalmers-Bullock Ltd. Montreal.

Engines, Gas
Allis-Chalmers-Bullock Ltd. Montreal.

Engines, Gasoline
Canadian Fairbanks Co., Ltd. Montreal.
Ontario Wind Engine & Pump Co. Toronto.

Engines, Hoisting
Allis-Chalmers-Bullock Ltd. Montreal.
American Hoist and Derrick Co. St. Paul.
M. Beatty & Sons. Welland, Ont.
Dominion Equip't & Supply Co., Winnipeg.
I. Matheson & Co. New Glasgow, N.S.
Polson Iron Works, Ltd. Toronto.
Russell Wheel & Fdry. Co., Detroit, Mich.

Engines, Stationary and Marine
I. Matheson & Co. New Glasgow, N.S.
Polson Iron Works, Ltd. Toronto.
Robb Engineering Co., Ltd. Amherst, N.S.

Engines, Steam
Allis-Chalmers-Bullock Ltd. Montreal.

Explosives
Standard Explosives Limited. Montreal.

Express Office Signs
Acton Burrows Limited. Toronto.

Fencing
Owen Sound Wire Fence Co., Owen Sound.

Ferro-vanadium
American Vanadium Co. Pittsburg, Pa.

Fire Appliances
Miller Chemical Engine Co., Chicago, Ill.

Fire Brick
Mussens Limited. Montreal.

Flags
The Hudson's Bay Co.

Flour
The Hudson's Bay Co.

Forgings
American Vanadium Co. Pittsburg, Pa.
Canada Car Co., Limited. Montreal.
Cleveland City Forge & Iron Co., Cleveland.
Crossen Car Mfg. Co. Cobourg, Ont.
Hamilton Steel & Iron Co., Ltd., Hamilton.
Nova Scotia S. & C. Co., New Glasgow, N.S.
Standard Steel Works Co., Philadelphia, Pa.

Foundry Appliances
Goldschmidt Thermit Co. Toronto.
Ont. Wind Eng. & Pump Co., Ltd., Toronto.

Frogs
Canadian Ramapo Iron Wks., Niagara Falls.

Furnaces, Corrugated
Continental Iron Works. Brooklyn, N.Y.

Fuse Batteries
Standard Explosives Limited. Montreal.

Fuse Detonators
Standard Explosives Limited. Montreal.

Fuses, Electric
Standard Explosives Limited. Montreal.

Gaskets
The Holden Co., Ltd. Montreal.
McCord & Co. Chicago, Ill.

Gates
Owen Sound Wire Fence Co. Owen Sound.

Gates, Crossing
General Railway Signal Co. Rochester, N.Y.
The N. L. Piper Ry. Supply Co. Toronto.

Gauges, Locomotive
Taylor & Arnold. Montreal.

Gears
American Vanadium Co. Pittsburg, Pa.

Generators, Electric
Northern Electric & Mfg. Co., Ltd. Montreal.

Grates, Shaking
Babcock & Wilcox, Ltd. Montreal.
Polson Iron Works, Ltd. Toronto.

Groceries
The Hudson's Bay Company.

Guides and Outfitters
Otto Bros. Field, B.C.

Hammers, Cast Steel
American Brake Shoe & F'dry Co. Mahwah.
James Smart Mfg. Co. Brockville, Ont.

Handcars
Canadian Fairbanks Co., Ltd. Montreal.
Crossen Car Mfg. Co. Cobourg, Ont.
Dominion Equip't & Supply Co., Winnipeg.
F. H. Hopkins & Co. Montreal.
Mussens Limited. Montreal.
Rice Lewis & Son. Toronto.

Hardware
The Hudson's Bay Co. Toronto.
Rice Lewis & Son. Toronto.

Hats
W. H. Coddington. Hamilton, Ont.

Headlights
Commercial Acetylene Co. Toronto.
The N. L. Piper Ry. Supply Co. Toronto.
Pyle National Elec. Headlight Co. Chicago.

Headlinings
Crossen Car Mfg. Co. Cobourg, Ont.

Heaters, Feedwater
Robb Engineering Co., Ltd. Amherst, N.S.

Heating, Car
Canadian Gold Car H'g & L'g Co. Montreal.
Safety Car Heating & L'ting Co. New York.

Hoists, Electric
American Hoist & Derrick Co. St. Paul.
Northern Engineering Works, Detroit, Mich.

Hoists (Pneumatic)
Taylor & Arnold. Montreal.

Hollow Staybolt Iron and Steel Bars
Falls Hollow Staybolt Co. Cuyahoga Falls.

Hoppers, Car (Wet or Dry)
Duner Co. Chicago, Ill.

Hydrants
Canadian Fairbanks Co., Ltd. Montreal.
Kerr Engine Co. Walkerville, Ont.

Illustrations
Acton Burrows Limited. Toronto.

Injectors
T. McAvity & Sons. St. John, N.B.

Inspections
R. W. Hunt & Co. Montreal.

Insurance, Accident
Can. Casualty & Boiler Ins. Co. Toronto.
Canadian Ry. Accident Ins. Co. Ottawa.
Imperial Guarantee & Ac. Ins. Co. Toronto.

Insurance, Boiler
Canadian Casualty & Boil. Ins. Co. Toronto.

Interlocking Plant and Signals
General Railway Signal Co. Rochester, N.Y.
Montreal Steel Works. Montreal.

Saxby and Farmer, Ltd. Montreal.

Iron and Steel Bars
Hamilton Steel & Iron Co., Ltd. Hamilton.

Iron, Pig
Hamilton Steel & Iron Co., Ltd. Hamilton.
Nova Scotia S. & C. Co., New Glasgow, N.S.

Iron Signs
Acton Burrows Limited. Toronto.

Iron Staybolt Bars
Falls Hollow Staybolt Co. Cuyahoga Falls.

Jacks
 Canadian Fairbanks Co., Ltd. Montreal.
 Dominion Equip't & Supply Co., Winnipeg.
 H and E Lifting Jack Co., Waterville, Que.
 F. H. Hopkins & Co., Ltd. Montreal.
 Montreal Steel Works, Ltd. Montreal.
 Mussels Limited. Montreal.
 A. O. Norton. Coaticook, Que.
 James Smart Mfg. Co. Brockville, Ont.
 A. R. Williams Mchy. Co., Ltd. Toronto.

Japans
 The Dougal Varnish Co. Ltd. Montreal.

Journal Bearings
 Canadian Bronze Co. Montreal.
 Crossen Car Mfg. Co. Cobourg, Ont.
 Kerr Engine Co. Walkerville, Ont.
 Jas. W. Pyke & Co. Montreal.

Journal Boxes
 The Holden Co., Ltd. Montreal.
 McCord & Co. Chicago, Ill.

Journal Jacks
 A. R. Williams Mchy. Co., Ltd. Toronto.

Lager Beer, &c.
 E. L. Drewry. Winnipeg.

Lagging and Covering, Locomotive
 Taylor & Arnold. Montreal.

Lamps, Arc
 Northern Electric & Mfg. Co. Ltd. Montreal.

Lamps, Incandescent
 Canadian Westinghouse Co. Hamilton, Ont.

Lamps and Lanterns
 The Hudson's Bay Company. Montreal.
 The Hiram L. Piper Co. Toronto.
 The N. L. Piper Ry. Supply Co. Toronto.

Lamps, Switch
 The N. L. Piper Ry. Supply Co. Toronto.

Lathes
 John Bertram & Sons Co. Dundas, Ont.

Laths
 J. Harrison & Sons Co. Owen Sound, Ont.

Lighting, Car
 Canadian Gold Car H'g & L'g Co. Montreal.
 Safety Car H'g & L'g Co. New York.

Lights, Contractors' and Wrecking
 F. H. Hopkins & Co. Montreal.
 International Marine Signal Co. Ottawa.
 Mussels Limited. Montreal.

Locomotives (Compressed Air)
 Baldwin Locomotive Works. Philadelphia.
 Canadian Locomotive Co. Kingston, Ont.
 Montreal Locomotive W'ks (Ltd.) Montreal.

Locomotives (Electric)
 Baldwin Locomotive Works. Philadelphia.
 Montreal Locomotive W'ks (Ltd.) Montreal.

Locomotives (Logging)
 Baldwin Locomotive Works. Philadelphia.
 Canadian Locomotive Co. Kingston, Ont.

Locomotives (Rack)
 Baldwin Locomotive Works. Philadelphia.
 Canadian Locomotive Co. Kingston, Ont.
 Montreal Locomotive Works. Montreal.

Locomotives (Steam)
 American Car & Equip. Co. Chicago, Ill.
 Baldwin Locomotive Works. Philadelphia.
 R. M. Burns & Co. Chicago, Ill.
 Canadian Fairbanks Co., Ltd. Montreal.
 Canadian Locomotive Co. Kingston, Ont.
 Dominion Equip't & Supply Co., Winnipeg.
 J. T. Gardner. Chicago, Ill.
 Hicks Locomotive & Car Works. Chicago.
 Montreal Locomotive W'ks. Montreal.
 Vulcan Iron Works. Wilkesbarre, Pa.

Lorries, Tracklaying
 Crossen Car Mfg. Co. Cobourg, Ont.
 F. H. Hopkins & Co. Montreal.

Lubricators
 The Holden Co., Ltd. Montreal.
 McCord & Co. Chicago, Ill.
 Taylor & Arnold. Montreal.

Lumber
 Parry Sound Lumber Co. Toronto.
 J. Harrison & Sons Co., Owen Sound, Ont.

Machinery, Cement
 Jas. W. Pyke & Co. Montreal.

Machinery and Plant, Contractors'
 American Hoist & Derrick Co. St. Paul.
 M. Beatty & Sons. Welland, Ont.
 R. M. Burns & Co. Chicago, Ill.
 Canadian Fairbanks Co., Ltd. Montreal.
 J. T. Gardner. Chicago, Ill.
 General Railway Signal Co., Rochester, N.Y.
 F. H. Hopkins & Co. Montreal.
 Mussels Limited. Montreal.
 Toronto Pressed Steel Co. Toronto.

Machinery, Hoisting
 American Hoist & Derrick Co. St. Paul.
 Brown Hoisting Machinery Co. Cleveland.

Machinery, Tracklaying
 F. H. Hopkins & Co. Montreal.

Machinery, Logging
 Russell Wheel & Fdry. Co., Detroit, Mich.

Machinery, Wood and Iron Working
 Canadian Fairbanks Co., Ltd. Montreal.

Machines, Boring and Turning
 John Bertram & Sons Co. Dundas, Ont.

Machines, Drilling
 John Bertram & Sons Co. Dundas, Ont.

Machines, Milling
 John Bertram & Sons Co. Dundas, Ont.

Machines, Planing and Shaping
 John Bertram & Sons Co. Dundas, Ont.

Machines, Radial Drilling
 John Bertram & Sons Co. Dundas, Ont.

Machines, Shaping
 John Bertram & Sons Co. Dundas, Ont.

Machines, Slotting
 John Bertram & Sons Co. Dundas, Ont.

Machine Tools
 John Bertram & Sons Co. Dundas, Ont.

Manhole Frames and Covers
 American Brake Shoe & Fdry Co. Mahwah.
 Canada Iron Corporation, Ltd. Montreal.

Marine Repairs
 Goldschmidt Thermit Co. Toronto.

Marine Supplies
 Rice Lewis & Son. Toronto.

Metal, Anti-friction
 W. Abbott. Montreal.

Metal, Babbit
 Tallman Brass & Metal Mfg. Co. Hamilton.

Metals
 Goldschmidt Thermit Co. Toronto.

Metal Work, Structural
 Canadian Bridge Co. Walkerville, Ont.
 Dominion Bridge Co. Montreal.
 Montreal Locomotive W'ks (Ltd.) Montreal.
 Jas. W. Pyke & Co. Montreal.

Milepost Numbers
 Acton Burrows Limited. Toronto.

Motors
 Canadian Fairbanks Co., Ltd. Montreal.
 McCord & Co. Chicago, Ill.

Motors, Electric
 Allis-Chalmers-Bullock Ltd. Montreal.
 Canadian Crocker Wheeler Co. Montreal.
 Northern Electric & Mfg. Co. Ld. Montreal.

Motor Generator Sets
 Allis-Chalmers-Bullock Ltd. Montreal.

Motors, Turntable
 Taylor & Arnold. Montreal.

Nickel
 The Orford Copper Co. New York.
 Nickel for Nickel Steel
 The Orford Copper Co. New York.

Numbers
 Acton Burrows Limited. Toronto.

Nut Locks
 Positive Lock Washer Co. Newark, N.J.

Nuts, Clevis
 Cleveland City Forge & Iron Co., Cleveland.
 Nuts, Square and Hexagon
 Montreal Rolling Mills Co. Montreal.
 Toronto Bolt and Forging Co. Toronto.

Oakum
 The Hudson's Bay Company. Montreal.

Office Fittings
 Can. Office & Sch'l Furniture Co. Preston.

Office Signs
 Acton Burrows Limited. Toronto.

Oils
 Galena Signal Oil Co. Franklin & Toronto.

Packing
 The N. L. Piper Ry. Supply Co. Toronto.

Paints
 Standard Paint & Var. Co., Windsor, Ont.

Patterns
 Hamilton Pattern Works. Hamilton, Ont.

Pile Drivers, Railway
 F. H. Hopkins & Co. Montreal.
 Mussels Limited. Montreal.

Pinch Bars
 The N. L. Piper Ry. Supply Co. Toronto.

Pipe, Culvert (Cast Iron)
 Gartshore-Thompson Pipe Co. Hamilton.

Pipe, Gas (Cast Iron)
 Gartshore-Thompson Pipe Co. Hamilton.

Pipe, Sewer (Cast Iron)
 Gartshore-Thompson Pipe Co. Hamilton.

Pipe Stocks
 Butterfield & Co. Rock Island, Que.
 A. B. Jardine & Co. Hespeler, Ont.

Pipe, Water (Cast Iron)
 Gartshore-Thompson Pipe Co. Hamilton.

Planers
 John Bertram & Sons Co. Dundas, Ont.

Platforms, Steel
 Standard Coupler Co. New York City.

Ploughs, Contractors'
 Mussels Limited. Montreal.

Ploughs, Grading
 Meaford Wheelbarrow Co., Ltd. Meaford.

Poles
 J. Harrison & Sons Co., Owen Sound, Ont.

Porter
 E. L. Drewry. Winnipeg.

Posts
 J. Harrison & Sons Co., Owen Sound, Ont.

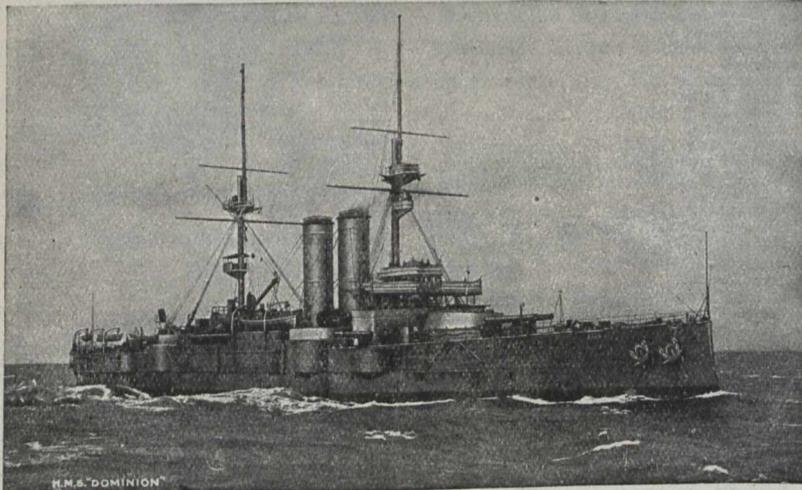
Powder, Blasting
 Standard Explosives Limited. Montreal.

Printing
 Southam Press. Toronto.

Pumps
 Canadian Fairbanks Co., Ltd. Montreal.
 S. F. Bowser & Co., Limited. Toronto.
 Ontario Wind Engine & Pump Co. Toronto.
 James Smart Mfg. Co. Brockville, Ont.

Pumps (Centrifugal)
 M. Beatty & Sons. Welland, Ont.

Rail Benders, Roller
 Dominion Equip't & Supply Co., Winnipeg.
 F. H. Hopkins & Co. Montreal.
 Montreal Steel Works. Montreal.



BABCOCK & WILCOX LIMITED

Patent Water-Tube Boilers

(Over 7,000,000 H.P. in use)

FOR MARINE AND STATIONARY PURPOSES

This cut shews H.M.S. "Dominion," in which are installed sixteen "B. & W." boilers—these are the standard adopted by the British Admiralty.

HEAD OFFICE FOR CANADA, 11 Place d'Armes
 BRANCH—TRADERS BANK BUILDING, TORONTO

= MONTREAL