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NEXT ANNUAL MEETING of the Grand Council in Mont-
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portance of the work justified the attention
which has been generally adopted for the
educating of the men, it is, however, safe to
assert that no other individual class have been
given the same privileges and opportunities
of acquiring technical education regarding
their vocation as the locomotive enginemen of
this country, and it is pleasing to note that
the advantages given are being embraced by
the men generally.

Although accelerated speed and long trains
are now the common practice on all our great
railway systems, in both passenger and
freight train service, the modern type of
locomotives with ample steam producing
qualities, and the universal application of the
air-brake equipment renders the practice an
accomplished success, as is very evident by
the degree of regularity with which trains are
handled from day to day on all the railway
systems. Notwithstanding the fact that the
locomotives have become larger and a great
amount of additional appliances have been
added to the same, the conditions prevailing
during recent years render the vocation of
the engineers very much less arduous,
and the work is attended with a greater
degree of safety than was the experience
in former years prior to the inception of
the modern safety methods and appliances,
and in other respects the engineer of the
modern locomotive has the advantage, as the
machinery and parts of the early locomotives
were, on account of weakness, susceptible to
frequent failure, and were a source of constant
trouble and risk to the engineers. Breakages
of side rods, crank pins, wheels, axles,
eccentric straps, etc., made up the daily list
of casualties; but, in the modern engines
these parts have all been strengthened or im-
proved, so that failures of that description
have almost disappeared, removing a diffi-
culty experienced by their predecessors on
account of these failures. Double tracking
of lines, block signalling systems and other
modern improvements have also contributed
to lessen the immunity from accident,
and to relieve the care and responsibility
of the engineers to a large extent. Good
judgment is, however, one of the most
essential characteristics required by the en-
gineers placed in charge of a locomotive en-
gaged in modern train service to obtain the
best possible results in handling the train
safely: the economical use of fuel and other
supplies and close attention to the condition
of the locomotive. Good judgment must be
exercised when handling long freight trains
so as to prevent damage to the draw gear,
etc. Economical fuel consumption is a ques-
tion to which the engineers should devote par-
ticular attention, as a small percentage of
saving by each individual engineer will effect
good results, when it is considered that the
coal consumed by the locomotives on the
Canadian railways last year cost nearly
\$7,000,000.

The motive power department of all rail-
ways must necessarily remain the great
money-spending department, and by good
locomotive management the engineers can
effect substantial savings and reduce the
working expense in many directions. It ap-
pears to be the generally recognized practice
that the engineers should graduate from the
ranks of the firemen; therefore, it is abso-
lutely essential that care be taken in making
the selection of the men entering the service
as firemen, who are to be trained to manage
the locomotives in the future. Their educa-
tion should be conducted along the same
channels as is now the practice to enable
them to render the companies the best pos-
sible service. The adoption of the larger
size locomotives for a time deterred a desir-
able class of men from entering the service,
as it was then considered necessary to be
some kind of a physical giant to handle the
coal consumed by one of our modern loco-

tives passing over a difficult division, loaded down to its full capacity. Actual experience has, however, demonstrated that this was an erroneous impression, as it simply required a little skill and knowledge of the requirements, rather than great physical strength, to accomplish the work. Now that this fact is generally known a good class of students are following up the work as firemen, from whom selections will be made in the future to successfully manage our modern locomotives.

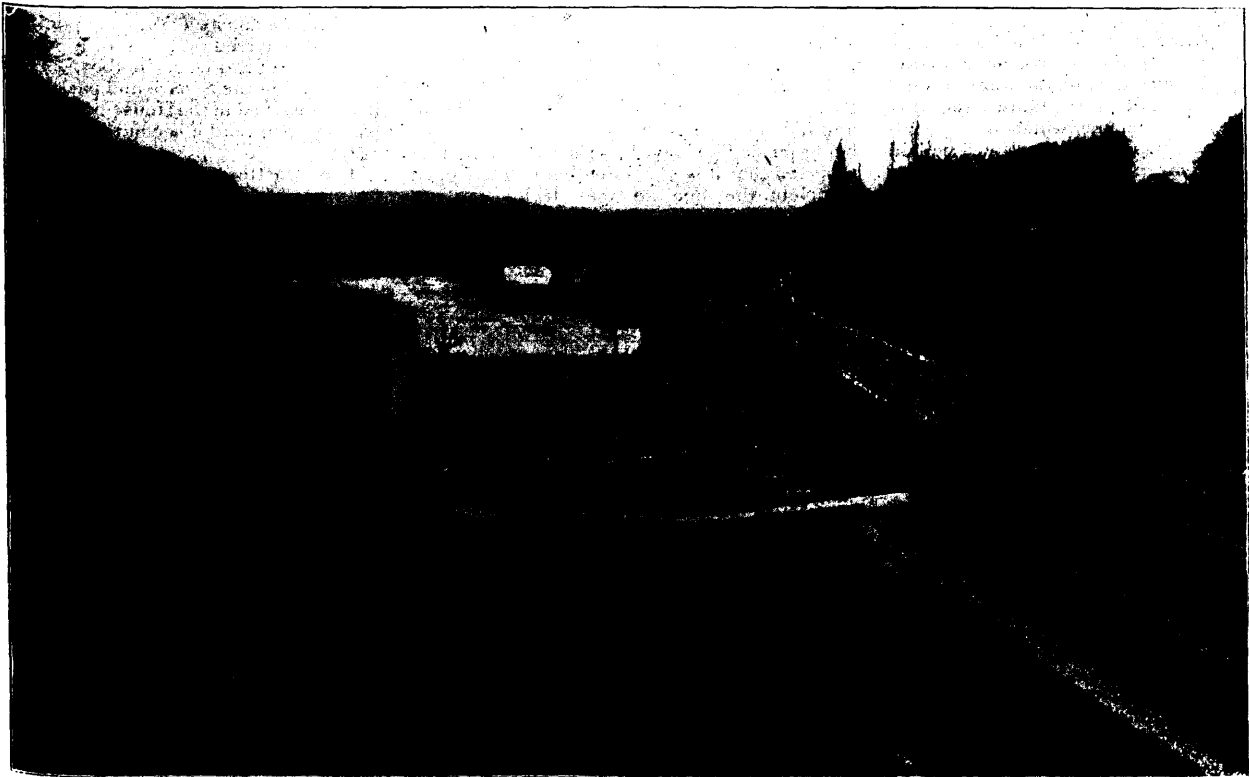
The foregoing paper was read at the last meeting of the Canadian Railway Club in Montreal.

Recent Dominion Legislation.

The following acts affecting steam and electric railways, shipping, telegraph, express

- Respecting the St. Clair and Erie Ship Canal Co.
- Respecting the Tilsonburg, Lake Erie and Pacific Ry. Co.
- Respecting the Windsor and Detroit Union Bridge Co.
- Incorporating the Indian River Ry. Co.
- Incorporating the St. Lawrence and Northern Ry. Co.
- Incorporating the Nipissing and Ottawa Ry. Co.
- Incorporating the Strait of Canso Bridge Co.
- Respecting the Ontario Power Co. of Niagara Falls.
- Respecting the Central Counties Ry. Co.
- Respecting the Medicine Hat Ry. and Coal Co.
- Respecting the Vancouver, Victoria and Eastern Ry. and Navigation Co.

- Incorporating the Essex Terminal Ry. Co.
- Respecting the Hudson's Bay and North-West Ry.'s Co.
- Respecting the Canadian Northern Ry. Amending the pilotage act.
- Respecting the Montreal and Southern Counties Ry. Co.
- Incorporating the Toronto and Niagara Power Co.
- To amend the provision with regard to tolls of chap. 1, statutes of 1881, respecting the C.P.R.
- Amending the Acts relating to the Ottawa, Northern and Western Ry. Co.
- Incorporating the Yukon Pacific Ry. Co.
- Respecting the United Gold Fields of B.C. (Limited).
- Respecting the North'n Colonization Ry. Co.
- Incorporating the Manitoba and Keewatin



THE INTERPROVINCIAL BRIDGE BETWEEN OTTAWA, ONT., AND HULL, QUE.

This bridge has recently been acquired by the C.P.R. Co. in connection with its purchase of the Ottawa Northern and Western, Pontiac Pacific Junction and Hull Electric railways. The platform is 65 ft. 2 in. wide, accommodating 1 steam railway track, 2 electric railway tracks, 2 carriage ways and 2 sidewalks. A complete description appeared in our issue of July, 1900. The illustration shows the approach to the bridge from the Central station, Ottawa, along the edge of Nepean Point. The locks shown are on the Rideau canal, connecting it with the Ottawa river. At present the bridge is used by the Ottawa Northern and Western, the Pontiac Pacific Junction and the Hull Electric railways. Beginning June 15 the C.P.R. transcontinental trains will run between Montreal and Ottawa via Vaudreuil and the short line, instead of on the north side of the Ottawa river, as at present. From the Central Station, Ottawa, the train will cross over the Interprovincial bridge to Hull, thence over the north shore line to the Union Station in Ottawa, and thence west, as at present. The eastbound transcontinental trains will also use the bridge.

- and kindred interests, were passed at the last session of the Dominion Parliament :
- Respecting the Orford Mountain Ry. Co.
- Respecting the Canada Southern Ry. Co.
- Respecting the Canada and Michigan Bridge and Tunnel Co.
- Respecting the River St. Clair Ry. Bridge and Tunnel Co.
- Respecting the Edmonton and Slave Lake Ry. Co.
- Respecting the Quebec and Lake Huron Ry. Co.
- Changing the name of the Port Dover, Brantford, Berlin and Goderich Ry. Co., to the Grand Valley Ry. Co., and for other purposes.
- Respecting the Buffalo Ry. Co. and the International Ry. Co.
- Incorporating the Velvet (Rossland) Mine Ry. Co.
- Incorporating the Battleford and Lake Lenore Ry. Co.

- Respecting the Medicine Hat and Northern Alberta Ry. Co.
- Respecting the Manitoba and North Western Ry. Co. of Canada.
- Incorporating the Knapp Tubular Steamship Co.
- Respecting the James Bay Ry. Co.
- Respecting the Klondike Mines Ry. Co.
- Respecting the Pacific, Northern and Omineca Ry. Co.
- Incorporating the Canadian Northern Express Co.
- Respecting the Timigami Ry. Co.
- Respecting the Niagara, St. Catharines and Toronto Ry. Co.
- Respecting the Canadian Pacific Ry. Co.
- Respecting the Ottawa, Brockville and St. Lawrence Ry. Co.
- Respecting the Trans-Canada Ry. Co.
- Respecting the Bay of Quinte Ry. Co.
- Respecting the Lake Champlain and St. Lawrence Ship Canal Co.

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- Incorporating the Nepigon Ry. Co.
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- Respecting the Montreal, Ottawa and Georgian Bay Canal.
- Respecting the Bell Telephone Co. of Canada.
- Respecting the Algoma Central and Hudson's Bay Ry. Co.
- Respecting the Manitoulin and North Shore Ry. Co.
- Respecting the Quebec Southern Ry. Co.
- Amending the railway act.
- Respecting the South Shore Ry. Co.
- Respecting the Lake Erie and Detroit River Ry. Co.
- Incorporating the Canada Central Ry. Co.
- Incorporating the Montreal Subway Co.
- Respecting the Royal Marine Insurance Co.
- Respecting the Coasting Trade of Canada.
- Incorporating the Canadian Northern Telegraph Co.

RAILWAY DEVELOPMENT.**Projected Lines, Surveys, Construction, Betterments, Etc.**

Alaska.—Another company seeking to construct a railway in Alaska is the Alaskan Central Ry. Co., incorporated in Washington state. It proposes to build about 570 miles to connect Resurrection bay and Rampart city, on the Yukon river. C. M. Anderson, Seattle, Wash., is one of the promoters, and is reported to have been appointed Chief Engineer.

The Trans-Alaskan Ry. Co. is applying to the U.S. Congress for a land grant in aid of its proposed line from Cook Inlet to Bering strait, Alaska. (April, pg. 121.)

It is reported that work on a line projected from Valdez to Eagle City will be at once commenced. The distance is about 400 miles. (Feb., pg. 54.)

Alberta Ry. and Coal Co.—We are officially informed that work on the widening of the line between Lethbridge and the International boundary has been commenced, and that it is expected to have the line widened to standard gauge by Sept. 1. The track will be laid with 56 and 60 lb. rails. At the boundary the line joins the Great Falls and Canada Ry.,

recently sold to the Great Northern Ry., U.S.A. This line to Great Falls is also being widened to standard gauge. (Feb., pg. 54.)

Algoma Central and Hudson's Bay Ry.—The agreement between the Clergue companies and the town of Sault Ste. Marie, Ont., dated July 6, 1900, provides, so far as the A.C. and H.B. Ry. is concerned, that the line will be completed to a junction with the C.P.R., at or near Missanabie, within four years, and that for 25 years the Co. will maintain its terminals in Sault Ste. Marie, Ont. Certain lands in the town are granted for railway purposes, and the amount of taxes on the whole of the Co.'s properties is fixed.

The Co. has recently been given permission by the town council to lay a new track into the Bruce st. station, Sault Ste. Marie, across certain streets. A stone station is to be built at Bruce st. at a cost of \$40,000.

A spur about 3 miles in length has been completed from the main line to the Breitung Iron Co.'s mine.

The main line has now been completed to Pangissin, 70 miles from Sault Ste. Marie, and a daily train is being run. The work is being pushed on beyond this point, and it is reported that it is the intention of the Co. to complete the line so that trains can run

through from Sault Ste. Marie to Michipicoten harbour this year. This will carry the main line to Park Lake Jct., about 80 miles from Pangissin, to which point the construction of 5 miles of line from Josephine mine, will bring the Michipicoten branch. The principal feature in the construction of the main line will be the bridging of the Montreal river, 20 miles north of Pangissin. The bridge, which will be 1,500 ft. in length, will cross the river at an elevation of 130 ft., and will cost \$200,000. (April, pg. 121.)

By an act passed at the recent session of the Dominion Parliament, the A.C. and H.B. Ry. Co. is authorized to issue bonds to the extent of \$30,000 a mile, instead of \$20,000 allowed by former acts.

Atlantic and Lake Superior Ry.—The trustees of the bondholders asked at the recent session of the Dominion Parliament that all the powers of the original company in regard to the construction and operation of the line be conferred on them for a period not to continue beyond Dec. 31, 1907. The bill was presented in the Senate and passed there, but it was dropped in the House of Commons after having been read a second time. (April, pg. 121.)

The Battleford and Lake Lenore Ry. Co. was incorporated with the powers

Galena-Signal Oil Company,

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Successor to Galena Oil Company and Signal Oil Company, sole Manufacturer of the celebrated Galena Coach, Engine and Car Oils, and Sibley's Perfection Valve and Signal Oils.

CHARLES MILLER,
PRESIDENT.

asked for at the recent session of the Dominion Parliament. (April, pg. 121.)

Bay of Quinte Ry.—An act was passed at the last session of the Dominion Parliament authorizing this Co. to construct a line from Deseronto to the northerly or westerly shore of the Bay of Quinte; from some point on such line to the shore of the bay, thence through Prince Edward county to lake Ontario, and from this second line to Picton; and also granting an extension of time for the commencement and completion of its lines for two and five years respectively. It is reported that engineers have surveyed a route for a direct line between Deseronto and Napanee; and for an extension of the line from Tweed, northerly through Bridgewater and Bannockburn. We are officially informed that it will be some little time before any decision is arrived at in regard to construction. (April, pg. 121.)

The B.C. Electric Ry. Co. has completed an extension of its Vancouver lines from the present terminus in Powell st., along Cordova st., to the C.P.R. terminus. Shops for car building are being erected at Vancouver in which all repair work will be done in addition to the turning out of one new car a month. It is proposed to erect a 5,000 h.p. power plant in Vancouver.

Work has been commenced on the 2-mile tunnel to connect Coquitlam lake and Lake Beautiful, near Vancouver, in connection with the scheme for the development of the water power there and its transmission to Vancouver. The project is being carried out by the Vancouver Power Co. (Ltd.), of which J. C. M. Buntzen, General Manager of the B.C.E. Ry. Co., is Manager. It is proposed to develop 20,000 h.p., and to utilize the power for the street cars, for lighting and for general manufacturing purposes. (April, pg. 121.)

Bedford Electric Co. (Ltd.)—Press reports state that a contracting engineer from New York city has just been over the route of the Co.'s proposed electric railway in Halifax County, N.S., and estimates the cost of construction at \$75,000.

British Columbia and Yukon Ry. Co.—An application was presented at the recent session of the Dominion Parliament for the incorporation of a company with this title to construct a railway from the B.C. boundary to the Yukon river below Rink rapids, and thence via Selkirk to Dawson, but the bill was withdrawn by the promoters. (April, pg. 121.)

Bruce Mines and Algoma Ry.—The contractors, Birmingham and McMartin, started work in the beginning of May to finish the ballasting of the line, which they were compelled to leave uncompleted last year. The ballasting on about 4 miles of grading has to be completed. It is probable that the 4 miles from Bruce Mines station to Lake Huron will be constructed this year. (April, pg. 121.)

Calgary and Edmonton Ry.—The Dominion Parliament was asked, at the recent session, to revive the Co.'s act of incorporation, and to authorize the construction of a line from its southern terminus to the International boundary, with branches from Strathcona, Wetaskiwin, and Lacombe, easterly; and granting five years within which to complete the line. In the committee considerable opposition developed, the main grounds being that the bill would revive the land grant voted in 1890; that the bonding power of \$25,000 a mile was excessive; and that it did not provide for the protection of existing towns. The promoters inserted a clause providing that the bill should not be construed as reviving the land grant, but the opponents were not satisfied, and as the supporters of the bill would not allow the preamble to be put, it was placed at the bottom of the list, and had not again been reached at the close of the session.

The surveys recently made for the proposed extension of the line from Macleod, Alta., to the International boundary are only of a preliminary character, and no definite route has been decided on. The surveys made run southerly from Macleod through the Blood reserve to Cardston, from near which town two lines were run to the boundary. There is very little difference in the length of the two lines, the longest being 61 miles. No further work will be done in connection with the proposed extension, as the Co.'s powers have lapsed. (April, pg. 121.)

Canada Atlantic Ry.—It is reported that the Co.'s repair shops at Ottawa, which were burned down Mar. 21, will not be rebuilt, but that all the work will be done at the main shops, Ottawa East. (April, pg. 121.)

Canada Central Ry. Co.—T. W. Patterson, Vancouver, B.C.; E. F. B. Johnston, Toronto; B. W. Folger, Kingston, Ont.; J. Millen, Duluth, Minn., and P. Weidner, Detroit, Mich., were incorporated at the recent session of the Dominion Parliament under this title to construct a railway from the mouth of the French river to Whanapitae lake, to the headquarters of Montreal river, thence northwesterly to the Albany river at the Ontario boundary, thence through the district of Keewatin and Manitoba to Lake Winnipeg, thence 70 miles north of Prince Albert, Sask., and Edmonton, Alta., to Tête Jaune Cache, B.C., thence southerly via Kamloops to Princeton, and thence to New Westminster and Vancouver; with a branch to Port Arthur, Ont. The Co. is given power to own and operate ferries and steamships and to carry on a general navigation business, to develop and distribute electrical power, and a number of other powers of a general nature. The authorized capital is \$15,000,000, and bonds and other securities may be issued, and the Co. may enter into agreements with the C.P.Ry. Co., the Canadian Northern Ry. Co., or any other railway company with connecting lines. (April, pg. 121.)

Canada and Michigan Bridge and Tunnel Co.—The Dominion Parliament at its recent session granted the extension of two years asked for. (April, pg. 122.)

Canada National Ry.—A deputation headed by J. H. Boyle, Secretary, waited on the Toronto city Board of Control recently in reference to the Co.'s projected terminals at Ashbridge's marsh. He stated that the Co. could bring 50,000,000 bush. of grain a year to Toronto for transshipment; that 25 or 30 large vessels would be employed; that freights would be $\frac{1}{4}$ c a bushel less than by Buffalo; and that return cargoes of Nova Scotia coal would be provided. The deputation was referred to the City Engineer. (April, pg. 122.)

The Canada Southern Ry. Co. was granted, at the last session of the Dominion Parliament, an extension of time until 1907 for the commencement, and until 1912 for the completion of the works authorized by its acts. (April, pg. 121.)

The Cape Breton Electric Co. has entered into an agreement with the town of North Sydney, N.S., for a street railway franchise, paying 2% of the gross earnings, and an annual license fee of \$200 until the town has a population of 10,000, and \$400 yearly thereafter. A line is also to be constructed between North Sydney and Sydney Mines.

Work was commenced April 30, on the construction of the Co.'s lines in Sydney, and 300 men were reported to be employed. J. Mac-Campbell is superintending the construction of the lines, some of which will be put in operation by July 1. (April, pg. 122.)

See also Sydney and Glace Bay Ry. Co.

Cape Breton Ry.—We were officially informed May 10, that track had been laid from Point Tupper to river Inhabitants 8 miles, and that $2\frac{1}{2}$ miles of sidings had been completed. One abutment of the bridge over the

river Inhabitants was completed, and the second one was under way. The grading from the opposite bank of the river Inhabitants to St. Peters was expected to be ready for track laying by the end of May. Tenders will be asked for shortly for the construction of the line from St. Peters to Louisburg. (April, pg. 122.)

The annual report of M. Murphy, D.Sc., Provincial Engineer, states that on Oct. 1, 1900, a contract was signed between the C. B. R. Co. and the N. S. Government for the construction of a line from the I.C.R. near Port Hawkesbury, to St. Peters, about 30 miles, and that work was commenced thereon July, 1901. The grading from Point Tupper to St. Peters was, at the date of the report, about two-thirds finished, all the small culverts and one-half of the concrete culverts were completed, and the abutments of the river Tillard bridge were under construction. Track had been laid for about four miles from Point Tupper, and for about $1\frac{1}{2}$ miles of sidings at Cass Cove, with a spur to the wharf. Rails were on hand for 40 miles of line, 60 lb. and 72 lb. steel being used for the main line, and 56 lb. for the sidings.

Carberry Central Ry. Co.—N. Boyd, M.P., R. M. Harrison, R. F. Lyons, M.L.A., G. Barrett and R. I. M. Power, of Carberry, and W. J. Boyd, of Winnipeg, were incorporated at the last session of the Manitoba Legislature, under this title to construct a railway from tp. 1 or 2, range 10, 11 or 12 west of the principal meridian, northerly or northwesterly to Carberry, and thence to the northern boundary of the province. The Co. may issue \$400,000 of capital stock, and bonds to the extent of \$20,000 a mile, and is given two years to commence its line.

Central Counties Ry.—The Dominion Parliament at its recent session passed an act changing the date for the holding of the annual meeting from April to Sept., increasing the power to issue bonds from \$15,000 to \$20,000 a mile, and giving a five years' extension of time to complete the line authorized from Hawkesbury to South Indian. See Great Northern Ry. of Canada, Sept, 1901, pg. 273.

Central Ontario Ry.—Extensive improvements are contemplated during the current year. Three new bridges will be constructed, two between Hillier and Consecan, and one near Glen Ross; $6\frac{1}{2}$ miles of track are to be relaid with 70 lb. steel rails, between Gilmour and Ormsby Jct.; and the 56 lb. rails taken up are to be utilized to replace 45 lb. rails, between Picton and Trenton. On the Bancroft extension some of the embankments are to be widened, and other work done, while on the line generally 20,000 new ties are to be put in and 3,000 cars of ballast distributed. In addition to the new station at Picton, a new station is to be erected at Bannockburn, and shelters at Millbridge and St. Ola. (April, pg. 123.)

Chateaugay and Northern Ry.—It is said that construction on this line from Bout de l'Isle to Joliette, Que., is to be proceeded with this year. The Great Northern Ry. of Canada will have charge of construction. (Nov., 1901, pg. 333.)

Chignecto Marine Ry.—A. D. Provand, on behalf of the shareholders in this Co., recently made another endeavor to obtain from the Dominion Government some compensation for the money invested in this project on the strength of a subsidy voted, but afterwards withdrawn. The proposal did not meet with any support from the members of the House of Commons who were called together to discuss the matter. Mr. Provand suggests that \$2,000,000 should be awarded as compensation.

Crow's Nest Southern Ry.—Track laying was recommenced in the middle of March

and is expected to reach Elko early this summer. The track was laid to Elk river, where there will be some delay owing to the construction of a large bridge. Grading is being pushed between Elko and Morrissey. At a recent sitting of the Railway Committee of the Privy Council permission was granted the C. N. S. Ry. Co. to carry its tracks across those of the B. C. Southern Ry. (C.P.R.) at Elko and at the mouth of Morrissey creek. A station has been built at Gateway on the International boundary where the C. N. S. Ry. joins the Montana and Northwestern Ry. Co.'s line from Jennings, Mont. (April, pg. 123.)

The Cuba Co.'s railway from Havana to Santiago is expected to be opened early in June. E. S. Clouston and R. B. Angus, of Montreal, who returned recently from Cuba, stated that track was being laid at the rate of 3 miles a day, and the gaps were being rapidly filled in. The whole system is about 400 miles in length. Sir Wm. Van Horne, President of the Co., on his return to Montreal, May 20, said the line would be completed in a couple of weeks thereafter. (April, pg. 123.)

Cumberland Ry. and Coal Co.—The press reports that it was proposed to construct a line from Springhill to Advocate Harbor, N.S., about 70 miles, or from Parrsboro to Advocate Harbor, are denied. The Co. is reported to have purchased additional coal lands at Springhill and in Cape Breton. (April, pg. 123.)

Dominion Atlantic Ry.—It is reported that 8¾ miles of track east of Kentville, N.S., are to be relaid with 80 lb. steel rails during the summer, that 65,000 new ties are to be put in, and 2,000 car loads of ballast distributed over the line. A considerable length of new fencing is also to be built. At Kentville the station building is to be improved, and the shops are to be rearranged.

Dominion Ry. and Power Co.—The application made to the Dominion Parliament at the recent session for an act incorporating a company under this title was not proceeded with through all its stages in the Commons. (May, pg. 161.)

Duluth, Virginia and Rainy Lake Ry.—Track laying is reported to have recommenced near Rice lake, Minn., and contracts are said to have been let for the construction of the 80 miles required to carry the line from Rice lake, to which point grading was completed last year, to Koochiching, opposite Fort Frances, Ont. (April, pg. 123.)

Durham Switch Line Ry. Co.—The organization of this Co., which was incorporated at the last session of the Ontario Legislature, has been completed, with the following officers:—President, W. F. Cowham; 1st Vice-President and Managing Director, F. Barlow Cumberland; 2nd Vice-President, A. F. McLaren, M.P.; Treasurer, W. McKechnie; Secretary, P. W. Stanhope. The Co. has constructed 4½ miles of line from Durham, Ont., on the G.T.R., to Wilder's lake. The line, which will be used for conveying marl from Wilder's lake to the mills of the National Portland Cement Co. at Durham is being operated by the D. S. L. Ry. Co. (April, pg. 123.)

The Edmonton and Slave Lake Ry. Co.'s application to the Dominion Parliament for an act for the revival of its powers, and extending for five years the time within which the line from Edmonton to Slave Lake may be constructed, was granted at the recent session. (April, pg. 123.)

Edmonton, Yukon, and Pacific Ry.—At a special meeting of the shareholders held at St. John, N.B., April 21, the following were elected directors:—W. Mackenzie, D. D. Mann, Z. A. Lash, K.C.; F. Nicholls, J. M. Smith, L. Lukes, and W. H. Moore, all of Toronto. This is an entirely new board, and

replaces G. McAvity, of St. John, N.B., and his associates, who acquired the interest of the Edmonton incorporators of the Edmonton Ry. Co., the name of which was changed in 1896 to that of the E.Y. and P. Ry. Co. In 1898 a Dominion subsidy was voted for 50 miles of line from Edmonton westerly. The Co. was authorized in 1901 to enter into an agreement for amalgamation with the Canadian Northern Ry., and the election of the new board, with the removal of the headquarters to Toronto, marks the passing of the control of the line under the C.N. Ry. Co. The amalgamation of the two companies is not likely to take place for some time. No arrangements have been made for construction for this season. (April, pg. 123.) See also Canadian Northern Ry.

Essex Terminal Ry. Co.—J. J. Auld, F. A. Hough, Amherstburg, Ont.; E. Girardot, R. Loveland, J. G. Watson, Sandwich, Ont.; and S. A. King, Windsor, Ont., were incorporated at the recent session of the Dominion Parliament under this title, with a capital of \$500,000, to construct a railway from Walkerville, Ont., through the townships of Sandwich, East and West, the town of Sandwich, and Anderton, to Amherstburg, Ont., and with power to enter into an agreement with the G.T.R., C.P.R., Lake Erie and Detroit River Ry., the Michigan Central Ry., and

the Flint and Pere Marquette Ry. Co. (Feb., pg. 56.)

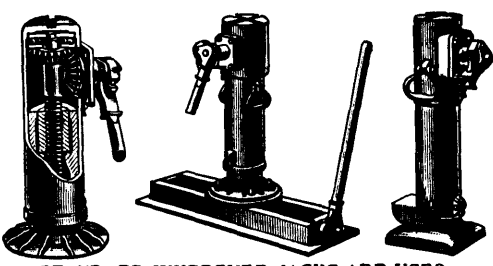
Fraser River Bridge.—The report of the B.C. Commissioner of Lands and Works, presented at the current session of the Legislature, contains details of the proposed bridge over the Fraser River at New Westminster, B.C., a description of which appeared on pg. 51 of our Feb. issue. The bridge, it is stated, is designed to carry a total live load of 700 lbs. per lineal foot over the whole structure, and the floor and suspenders to carry a live load of 80 lbs. per square foot of floor. Nothing has yet been done towards the erection of the bridge itself, but about 1½ miles of the west approach has been built. The contract for the substructure of the bridge has been awarded to Armstrong, Morrison and Balfour, of Vancouver, the estimated cost being about \$300,000. Preliminary operations have been commenced on the New Westminster side of the river. The contract for the superstructure has been let to the Dominion Bridge Co., Montreal. (April, pg. 123.)

Gaspe and Western Ry. Co.—W. Barwick, Toronto; Hon. J. B. R. Fiset, Rimouski, Que.; O. E. Talbot, Quebec; J. A. Ross, St. Flavie, Que.; C. A. Gauvreau, Isle Verte, Que.; M. Connelly, J. Q. Perrin, Montreal; and A. Colby, New York city, made application at the recent session of the Dominion

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Parliament for an act incorporating a company under this title to construct a railway from Fraserville, Que., on the Intercolonial Ry., to Gaspé Basin, with all the usual powers, and with power to enter into agreements with the Baie des Chaleurs Ry. Co., or the Atlantic and Lake Superior Ry. Co., for amalgamation or otherwise. The bill met with considerable opposition from the Minister of Railways, the bondholders of the Atlantic and Lake Superior Ry. and private members, and was abandoned. (Jan., pg. 2.)

The Great Eastern Ry. Co.'s application to the Dominion Parliament at its recent session for an act granting a further extension for five years, to enable it to complete its railway, authorized in 1891, from Huntingdon to Lévis, Que., with a branch to the International boundary near Hemmingford or Lacolle; and an additional branch authorized to be constructed in 1897, to connect its line with the Drummond County Ry. and the United Counties Ry., did not pass. Under acts passed prior to 1891, about 12 miles of line were constructed between Yamaska and St. Gregoire, which have since been merged in the Quebec Southern Ry. and the South Shore Ry.

Great Falls Power Co.—J. C. Gibson, J. McDiarmid, D. Sinclair, F. J. C. Cox and C. Chamberlain, were incorporated at the last session of the Manitoba Legislature under this title with general powers to develop water-powers, to generate electricity for manufacturing and other purposes, and to construct an electric railway from Winnipeg to Selkirk, or to some point on the Winnipeg river. The capital of the Co. is fixed at \$5,000,000, and bonds may be issued.

Great Northern Ry. of Canada.—It was recently reported that W. Seward Webb and those associated with him were in treaty for the purchase of the G. N. Ry. Some of the people who had been active in the purchase of the Canada Atlantic Ry., and the South Shore Ry., made a trip over the G. N. Ry. and inspected the terminals at Quebec, but the statement that they were negotiating a purchase is not credited, the more reasonable cause of their visit being to see to arrangements for handling the grain to be brought over the Canada Atlantic Ry. during the season of navigation. The G. N. Ry. has decided to add another conveyer at the Quebec elevator. (April, pg. 123.) See also Chateaugay and Northern Ry.

Great Northern Ry. (U.S.)—The surveys for the widening of the Great Falls and Canada Ry. from Great Falls, Mont., to a junction at the International boundary with the Alberta Ry. and Coal Co.'s line, to Lethbridge, Alta., 130 miles, have been completed and work was begun April 16.

The ballasting of the line of the Montana and Great Northern Ry. from Jennings, Mont., to a junction with the Crow's Nest Southern Ry. at Tobacco Plains on the International boundary is reported to have been completed.

Tracks has been laid on the Washington and Great Northern Ry., the U. S. section of the Vancouver, Victoria and Eastern Ry., from Marcus, Wash., to the International boundary at Cascade, B.C., and ballasting was expected to be completed in May. On the section from the boundary, 5 miles south of Grand Forks, B.C., to Republic, Wash., the Co. has had some difficulties with the Republic and Grand Forks Ry. Co., respecting the right of way. Certain points in the dispute were disposed of by the purchase of land, but others are still before the Washington courts for settlement.

The G. N. Ry. is reported to have constructed a ferry slip at Brownsville, B.C. (April, pg. 124.) See also Alberta Ry. and Coal Co., Crow's Nest Southern Ry.; Kettle Valley lines, and Vancouver, Victoria and Eastern Ry.

Halifax and South-Western Ry.—The Nova Scotia Legislature at its recent session ratified the contract entered into between the Government and Mackenzie, Mann & Co., for the construction of a railway from Halifax to Barrington Passage, connecting there with the existing Halifax and Yarmouth Ry., power being also given to purchase that line. The Attorney-General informed the House of Assembly that propositions to construct the line were also made by Ryan & Macdonald, Toronto; and the North American Trust Co. of New York; and that the Provincial Engineer estimated that the line would cost \$18,400 a mile. The estimate was considered by the Attorney-General to be a moderate one as the line would probably cost altogether about \$20,000 a mile. The contractors obtain a free right of way; freedom from taxes, and other exemptions, together with a loan of \$13,500 a mile, of which they are to repay \$10,300 a mile, with interest, in 40 years. The length of line to be constructed is about 220 miles.

Surveys of alternative routes were made in 1901, by H. K. Wicksteed. W. Mackenzie and D. D. Mann, met the Nova Scotia Cabinet early in May in reference to the route, when it was announced that construction would be gone on with on the sections between Halifax and Mahone Bay, and between Liverpool and Bridgewater. At this point connection will be made with the Nova Scotia Central Ry. which has been acquired by Mackenzie, Mann & Co. (April, pg. 124.)

Hamilton, Ancaster and Brantford Ry. Co.—Press reports state that financial arrangements have been completed for the early commencement of the construction of this line. (April, pg. 124.)

Hamilton and Caledonia Electric Ry.—A right-of-way has been granted by the Seneca and Caledonia councils; Glanford council has prepared a by-law to be passed at a future meeting, but the Barton council and the promoters of the Co. cannot agree on terms. We are informed that if the Barton council will pass a reasonable bylaw the Co. will be prepared to proceed with construction. (April, pg. 124.)

Hamilton Street Ry.—Unconfirmed reports state that an extension will be built to Bartonville, about five miles, this year.

Hope Mountains Exploration.—E. Dewdney's report on the survey made through the Hope Mountain district last year has been presented to the B. C. Legislature. "The result of the surveys," Mr. Dewdney states in conclusion, "shows that the Hope mountains cannot be crossed without encountering serious engineering difficulties, which would necessitate a very large expenditure of money, and I know of nothing so pressing either in the way of development along any line that might be determined on, to warrant its construction, outside of a few prospects that have been brought in by miners. There is nothing at present to give encouragement for this expenditure, except the existence of some very fine timber on the west slope." . . . "I have no doubt that you will be told that a better line can be obtained than the one we have surveyed and explored. Nothing but an instrumental survey can establish this. I can get no information that would warrant me in believing that there is, north of the boundary, any better line, and I can find no reports of U.S. surveys which would indicate that there is one of merit even by crossing from one country into the other." The details of the survey made are contained in the appended reports of the engineers in charge. H. Carry had charge of the party making a survey of the line through what is known as Railway pass. This pass approximates 4,160 ft. above sea level, and is 18½ miles in an air line from Hope, but owing to the mountainous country the survey showed that 38½ miles of track

would have to be constructed, of which 21¼ miles would be 2½%, 4 miles 2%, and 13¾ miles of ½% gradients. F. Moberley made a survey from the summit of Hope mountain to Similkameen, 39.65 miles. Starting from the summit a 2.5% grade was carried from mileage 1½ to mileage 10, from which point the grade runs from 2.2% to level. On this route the distance from Hope to Similkameen is 78.28 miles. Mr. Carry's estimate of the construction of his section is \$2,236,831, or \$57,904 a mile, and Mr. Moberley's estimate for the second section is \$1,186,328 or \$29,920 a mile, a total of \$3,423,159. Mr. Carry also made a survey of alternative routes: from Hope to Allison pass, 51 miles, the cost of which would average \$33,039 a mile, and from Hope to Tulameen, 67.63 miles, the cost of which was estimated to average \$32,849 a mile. Mr. Moberley made surveys to complete the latter line from Tulameen to Similkameen, 19.50 miles, at an average cost of \$29,920 miles, making a total of 87.3 miles, the estimated cost of which is \$2,805,034. For the completion of the route from Allison's pass to a junction with the end of Railroad pass route, Hislop's line, 50 miles, was adopted. This line is estimated to cost \$33,000 a mile, making a total for the route, via Allison's pass, of \$3,335,500. J. Hislop made a general survey of the Roche river country and provided data for the preparation of plans and profiles. In the Legislature, the Chief Commissioner of Lands and Works stated that the cost of the survey was \$14,071.92. (Feb., pg. 57.)

Hudson's Bay and Northwest Ry.'s Co.—At the recent session of the Dominion Parliament an extension of 3 years within which the lines authorized by its act of incorporation must be constructed was granted. (Jan., pg. 3.)

Huntsville and Lake of Bays Ry. Co.—Capt. G. F. Marsh, F. W. Clearwater, J. Whiteside, J. W. Hart, W. H. Mathews and H. S. May, Huntsville, Ont.; A. Marsh, Richmond Hill, Ont.; and J. J. McNeil, Toronto, were incorporated in 1900 by the Ontario Legislature under this title, to construct a steam or electric railway from the north end of Lake of Bays to the south end of Peninsula Lake; also from the east end of Lake of Bays to west end of Hollow Lake. Capt. Marsh is now endeavouring to obtain the capital necessary, about \$10,000, to construct the first of these lines, about 1½ miles in length, as a steam railway. It is reported that some grading has been done. (Mar. 1900, pg. 77.)

Indian River Ry.—M. P. Davis, R. J. Devlin, W. P. Davis, J. W. Thompson, Ottawa, and H. G. Harrison, Montreal, were incorporated at the recent session of the Dominion Parliament under this title, to construct a railway from the north end of Lake Megantic, Que., southerly along the lake to the International boundary at Riviere Morte, with power to enter into agreements with the C.P.R., the Rumford Falls and Rangeley Lakes Ry. Co., the Portland and Rumford Falls Ry. Co. and the Quebec Central Ry. Co. (April, pg. 125.)

Intercolonial Ry.—A number of bridges between St. John and Moncton, N.B., are being strengthened, pending the carrying out of more permanent strengthening or the erection of new ones.

The siding at Shubenacadie, N.S., is being lengthened to 3,000 ft., double its present capacity, and a number of additional sidings are to be put in at Moncton, N.B.

A branch line 6 miles in length will be constructed from Riviere Ouelle station, Que., to Riviere village, on the St. Lawrence, and a steamer will be placed on the river to connect with Murray Bay, on the opposite side. The work is to be rushed through to completion this season.

Contracts have been let for the remodelling of the freight shed at Nicolet, Que.; the improvement and extension of the freight sheds at St. Charles, Que.; for the remodelling of the stations at St. Philippe de Neri, Que., and Old Lake Road, Que.; and for the erection of new stations at Nicolet, Que., Eel River, N.B., and Pictou, N.S.; and tenders are under consideration for the erection of combined stations and freight houses at Pollett river and Boundary Creek, N.B.

The improvements being carried out at Sydney, N.S., include a new freight yard about half-a-mile in length, arranged on the most modern plans, east and west bound, and inwards and outwards freight being handled separately. A repair yard is being arranged in connection with the car repair and machine shops. In close proximity is being erected an 18 stall roundhouse, the stalls being 75 ft. each in length. The building is of brick, with iron columns and iron roof girders, and has a concrete floor. The boiler house close by is to contain two 100 h.p. boilers, with a complete plant for heating engine house, etc. Adjoining is the machine shop, and there will also be an office building with store and engineers' reading, rest, toilet and bunkroom building, 28 by 78 ft. At the roundhouse there will be a coal, ash and sand handling plant, with a storage capacity of 450 tons of coal. This plant is similar to one being erected at Moncton, N.B. The idea is that when the locomotives come in from the road they are to be immediately placed in this plant, where the fires will be cleaned and the ashes hauled into the dumping pit, and at the same time coal and sand will be supplied from the overhead storage. When there is an accumulation in the dump pit, the ashes will be conveyed to an overhead bin, until they can be removed in carload lots. The Moncton plant will have storage for 50 tons of sand, 450 tons of coal, and 2 carloads of ashes. No labor whatever will be used to operate it except for the hauling of the conveyer, and the operating of the slides to the chutes and hoppers. The object of its use is to facilitate the cleaning of the fires, and the supplying of coal and sand to the locomotives, to prevent delay at the terminals, and to reduce the cost of handling the engines at the terminal stations.

The following supplemental estimates were passed at the recent session of the Dominion Parliament:—

Engine house, etc., at Chaudiere Jct. \$63,000.
Increased accommodation at St. John—\$90,500.
Increased accommodation at Stellarton—\$17,000.

Increased accommodation at Sydney, (re-vote)—\$50,000.

Increased accommodation at Halifax, (re-vote \$90,000)—\$43,000.

To strengthen bridges, (re-vote)—\$50,000.

To provide additional siding room and increased accommodation and facilities along the line, (re-vote)—\$133,000.

To change couplers of passenger cars (re-vote)—\$8,000.
To provide new superstructure for six spans Miramichi bridge, (re-vote)—\$50,000.

To raise Sydney and Louisburg Ry. bridge over I.C.R. at Sydney, (re-vote \$3,300)—\$4,300.

Increased accommodation at Pictou, (re-vote)—\$5,000.

Station at Nicolet, (re-vote)—\$2,500.

Station and freight house at Eel River, (re-vote)—\$3,000.

Improvements at North Sydney—\$40,000.

Building a spur line I.C.R. station at Riviere Ouelle, to the wharf on the St. Lawrence—\$40,000.

Increased accommodation at Moncton, (re-vote \$32,000)—\$156,700.

Improvements at Rockingham, \$4,000.

International Transit Co.—Tenders have been asked for the construction of about 4½ miles of electric railway, including sidings, in Sault Ste. Marie, Ont. The route is from Superior st. to Hudson st., north to Cathcart, thence west to West st., to the proposed new bridge over the St. Marys river; thence to the base line and west to Tagona. The I. T. Co. is one of the Clergue enterprises, and has power to extend its tracks on to the proposed bridge, the charters for which have also been obtained from the Canadian and U. S. Governments in the Clergue interests. (July, 1901, pg. 215.)

An offer has been made to the adjoining village of Ironvale, by R. H. Brooks, G. Douglas and Goodwin Bros., to construct a street railway in connection with a water and light service, in return for a 10 year franchise. The council is considering a proposition to amalgamate with Sault Ste. Marie, in which case the I. T. Co. would receive the franchise.

Inverness Ry. and Coal Co.—M. Murphy, D.Sc., Provincial Engineer, in his annual report presented at the recent session of the Nova Scotia Legislature, states that a certificate was granted for traffic operations on this line from Port Hastings to Broad Cove, June 19, 1901; and from Port Hastings to a junction with the I.C.R., at Point Tupper, Dec. 19, 1901. Some additional work is required to be done all along the line before the restrictions as to speed of trains, 15 miles an hour between Point Tupper and Port Hastings, and 20 miles an hour between Port Hastings and Broad Cove, can be removed. The line is in fair condition considering the poor quality of ballasting material available. The total length of the

line is 61.325 miles, nearly half a mile beyond Broad Cove station. There are 14 stations on the line; the maximum curvature is .17 miles of 9°, and there are 9.03 miles of 6° to 7°; 25.81 miles being on curvature, and 35.52 on tangents. The heaviest ascending grade from the I.C.R. to Broad Cove is from 70 to 80 ft. to the mile, but of this there is only .95 miles, while descending there is 11.79 miles of 50 to 55 ft. a mile grade; 15.46 miles are level. Additional ballasting and other work is being done on the line in order to bring the standard up to the Government requirements so that the restrictions as to speed may be removed. (June, 1901, pg. 174.)

Press reports recently stated that the line would be extended from Broad Cove, 40 miles northerly to Cheticamp, this year, but we are informed that it is not likely there will be any construction gone on with beyond Broad Cove this year.

A shipping pier and coal handling plant is under construction at Port Hastings at a cost of \$75,000. The coal pockets will have a storage capacity of 4,000 tons, so arranged as to admit of considerable extension when the trade increases. W. Caddy is the engineer in charge of construction.

An act was passed at the last session of the N.S. Legislature authorizing the purchase by the I. and R. Ry. Co. of the property and assets of the Inverness-Richmond Collieries and Ry. Co., and to change the name of the amalgamated companies to the Inverness Ry. and Coal Co. (Ltd.) The I.R.C. and Ry. Co. was operating under a British charter when it was acquired by Mackenzie, Mann & Co., and application was made in Aug., 1901, for a charter under the Ontario Companies' Act to facilitate its transfer, and subsequently steps were taken to liquidate its affairs (Sept., 1901, pg. 273.)

James Bay Ry.—At the recent session of the Dominion Parliament an extension of five years was granted for the completion of this line from near Parry Sound, Ont., to James Bay, and power was given to construct a branch from the main line to Batchawana Bay, on Lake Superior. The line is in operation from a junction with the Canada Atlantic Ry., near Rose Point, to Parry Sound; the surveys have been completed to the French river, and construction will be proceeded with this year, as far as Ahmic Harbor on the Magnetawan river, about 35 miles. The contractors are Johnston, Beveridge and Poulin. (April, pg. 125.)

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Kettle Valley Lines.—The line operated under this name, and constructed from Grand Forks, B.C., to Republic Wash., 42 miles, under charters granted to the Grand Forks and Kettle River Ry. Co. in B.C., the Republic and Grand Forks Rd. Co. and the Republic and Kettle River Ry. Co. in Washington State, and covered in B.C. by the Dominion charter granted to the Kettle Valley Ry. Co., was completed April 12, when the last spike was driven by T. W. Holland, General Manager, and W. C. Morris, General Counsel in the U.S., and Assistant General Manager. The first sod was turned on June 5, 1901, and the whole line was under contract by Aug. 1. The northern terminus is in the Ruckle addition to Grand Forks, and after crossing the C.P.R. tracks, the line is an air one following the Kettle river on the southeast side to the International boundary, five miles distant. Crossing to the west bank of the river, the line passes through Nelson, Wash., the principal intermediate point, and about 1½ miles from Curlew, recrosses the Kettle river, and follows Curlew creek to the north end of Curlew lake. The nine-mile ascent is then commenced to the summit, which is crossed at Granite Creek Pass, and thence to Republic at a level of 1,000 ft. above Grand Forks. The maximum grade is 1½% compensated, and the maximum curvature 10°. The purpose of the line is to carry ores from the mines at Republic to the Granby smelter at Grand Forks, and as the heavy traffic will be on a descending grade the expenses of operating the line will be comparatively light; the ascending grade to Grand Forks after the summit is passed is .8%. J. A. Manley, Chief Engineer, had charge of construction, the general contractors being Ferguson & Co., of Spokane, Wash.

The construction of branch lines, including one from Ferguson to Sheridan Camp, is under consideration, but we were recently advised that no decision had been reached on the matter.

It is reported that the line is to be extended from Republic to Spokane, Wash. C. Ferguson, one of the contractors, states that the right of way of the old Spokane, Lake Shore and Eastern Rd. has been acquired, and that arrangements are in progress for going on with the work of extension. The C.P.R. is reported to be interested in the purchase. (April, pg. 126.)

Kingston and Pembroke.—We were recently advised that the extension of the line from Sharbot Lake to Carleton Jct. was under consideration. It is said to be probable that the work will be undertaken this year. We are advised that there is no intention whatever of moving the car shops from Kingston to Renfrew, as press reports stated. (April, pg. 126.)

The Klondike Mines Ry. Co., which was incorporated by the Dominion Parliament in 1899 to construct a steam or electric railway from Klondike City, Yukon, to Indian river, along its banks to the Yukon river, and along the Yukon to Dawson City, with various branches, was given power at the recent session of the Dominion Parliament to construct an extension from the Indian river to Stewart river. The issue of \$2,500,000 of bonds and the mortgage to secure the same, approved of April 19, 1902, was confirmed.

The line proposed to be constructed during the present year is from Klondike city to Stewart river. Starting from Klondike river the line will run up Bonanza creek to Grand Forks, 12 miles, with an ascending gradient of 1 7-10%; it will then cross over the divide to the Dome, with a maximum gradient of 2%, and then will proceed with a descending grade of 2% to the Indian river valley, and crossing the river at Eureka creek, will reach the summit between the Indian and Stewart rivers by a 2% gradient. The curvature will be light, except along Bonanza creek, where

it will be necessary to avoid mines and their workings, and where the maximum curve will be 16°. The grading will be mostly frozen muck and gravel, except near the mouth of Bonanza creek, where there will be some side-hill rockwork, and some cribbing to be put in along the river bank. On the divide near the Dome there will be some light rock work. There will be a number of culverts and bridges to be put in on the crossings of creeks and lateral streams running in, but they will be temporary structures of timber at first. The only large bridge will be across the Indian river, its exact location had not been definitely determined at the time of our last advices, though three preliminary surveys have been made. The line will be of 3 ft. gauge, and will be laid with English rails, 45 lbs. to the yard. It will probably be the most northerly railway in the world, with the exception of 12 miles of a 22 in. gauge line at Cape Nome, Alaska, called the "Wild Goose Rd."

A contract has been entered into with the Hawkins Construction Co. for the construction and equipment of the line, the Co. taking stock and bonds of the K.M. Ry. Co. in payment. The construction company is said not to be organized for the purpose of making profit, as the shareholders of the railway will receive a pro rata interest in the construction company. E. C. Hawkins will be in charge of construction, which was expected to be commenced in May, and to be completed to Grand Forks by July. Contracts are reported to have been let for 200,000 ties to J. J. Campbell, J. O'Brien, T. N. Sullivan, and the North American Trading and Transportation Co., each to supply 50,000. With this section completed it is expected that the line will be on a revenue producing basis. The line will go through the center of the entire mining district, and will open up the whole country for development on a far more economical scale than at present, and make possible the working of a large number of mines which contain ore of too low a grade to be worked profitably under present conditions of expensive transportation.

The original capital of the Co. was \$1,000,000, or an average of \$84,000 a mile, for the 12 miles from Klondike city to Grand Forks, the additional capital authorized \$1,500,000, in all \$2,500,000, which makes about \$21,000 or \$22,000 a mile for the additional 70 miles to Stewart river, reducing the average capitalization to about \$30,000 a mile. The cost of the line will be high on account of the expense of getting in material and equipment, the high freight rates to the coast, and the ocean and river transportation. The interests of the original promoters have been acquired for cash. It is stated that the line will cost from \$35,000 to \$38,000 a mile for construction and equipment, and 1st mortgage bonds to the extent of \$30,000 a mile of the entire line from Klondike city to Stewart river have been issued. The bonds have been underwritten by a firm in Manchester, Eng., and a portion will be placed on the market in Canada and the U.S. Stock is also being issued to the extent of \$2,500,000, and of this the Co. is offering \$750,000 at 80c. on the dollar in Dawson, San Francisco, St. Louis, Omaha, Chicago and Seattle. The provisional directors are: T. W. O'Brien, Dawson; E. C. Hawkins, Seattle; J. A. Seybold and H. B. McGivern, Ottawa. A new board of directors will probably be elected in June, and the head offices of the Co. moved from Ottawa to Dawson. (Feb., pg. 58.)

Lake Bennett Ry. Co.—The application to the Dominion Parliament for an act incorporating a company to construct a railway from Dyea river, B.C., via Lake Bennett, to Selkirk on the Yukon river, was dropped towards the end of the recent session. (April, pg. 141.)

Michael King, of Victoria, B.C., received a charter from the B.C. Legislature in 1901, in-

corporating the Lake Bennett Ry. Co. to construct the railway referred to. Acting under the advice of the Minister of Justice, the Governor-General on May 11, 1902, disallowed the act of incorporation.

Lake Erie and Detroit River Ry.—At the last session of the Dominion Parliament the agreement with the Erie and Huron Ry. Co., for the amalgamation of that Co.'s line with the L. E. and D.R. Ry. Co. was ratified, and the time limited for the completion of the uncompleted portion of the lines authorized from Leamington to Simcoe, and from Simcoe to Fort Erie, of which the section from Leamington to St. Thomas has been constructed, was extended for five years. The bill was opposed on behalf of the city of Chatham, where the shops of the E. and H. Ry. were situated, but this opposition was withdrawn on the assurance of the L. E. and D. R. Ry. Co. that they would not be closed or removed.

The Erie and Huron division is being relaid with 70 lb. steel rails, and a number of curves at Wallaceburg, Dresden and Sombra are being removed. The location of the line at Dresden will be removed a few rods further from the town, and at Wallaceburg the track will also be moved some little distance further from the business center, but there will not be any material change at Sombra.

At Walkerville the freight shed is to be moved, and the engine house to be enlarged by the addition of about 100 ft.

A coal hoisting plant is to be erected at Rondeau to tranship coal from vessels, the car ferry Shenango not being able to carry all the freight offering. The press reports that a summer hotel was to be erected at Rondeau are denied.

The new round house at St. Thomas is reported to be nearly completed, and new scales have been put in at the West Lorne stock yards by the Gurney Scale Co., of Hamilton. The ballasting on the L.E. & D.R. Ry., and on the E. & H. Ry., is to be completed during the year.

On the Port Stanley division two new bridges are to be erected, one of 164 ft. span, with masonry abutments, across the Thames a mile south of London, and the other about the same size, across Kettle creek, near Port Stanley. (April, pg. 141.)

The Levis County Ry. Co. was incorporated by the Quebec Legislature at its recent session. We were recently advised that contracts were being let for the construction of 10 miles of electric railway, of which 7½ miles will be along the road uniting the towns of St. Romuld, Levis, Bienville and St. Joseph, on the south shore of the St. Lawrence river, opposite Quebec city. The line is expected to be in operation by July 15. G. U. G. Holman, of Levis, is General Manager.

London Street Ry.—Approval has been given by the city council for the extension of the tracks on South and other streets. Work was recently started on the double tracking of the Railway st. line, but an injunction was obtained May 6, to prevent this being done. On the case being heard the action was dismissed with costs. The double tracking, the manager says, will be completed at once. (Oct., 1901, pg. 308.)

Lotbiniere and Megantic Ry.—See South Shore Ry.

Mabou and Gulf Ry. Co.—J. B. Cann, F.W. Huestis, Boston, Mass.; and R. Laidlaw, Cincinnati, Ohio, were incorporated at the last session of the Nova Scotia Legislature under this title to construct a railway from Mabou coal mines, N.B., to Mabou harbour, where a shipping pier will be erected; and to a junction with the Inverness and Richmond Ry., with a branch from Mabou to Orangedale on the I.C.R.; also from Hawkesbury on the I. and R. Ry. to Caribou cove, on the Strait of Canso, 8 miles. Surveys are reported to be

in progress for the projected line from the mines to the I. and R. Ry.

Manitoba and Keewatin Ry. Co.—D. W. Bole, F. W. Stobart, H. H. Chown, R. J. Whitla, R. T. Riley, G. D. Wood, and H. M. Howell, of Winnipeg, and D. C. Cameron, of Rat Portage, Ont., were incorporated at the recent session of the Dominion Parliament under this title to construct a railway from Winnipeg or Selkirk, Man., through the district of Keewatin to the mouth of Severn river, Hudson's bay, or any of the rivers southerly therefrom, with branch to the eastern shore of Lake Winnipeg, and the C.P.R., either in the Rainy river or Thunder bay districts. The Co. may construct telegraph and telephone lines, carry on a general navigation business, and engage in a variety of businesses in connection with its undertakings. (Dec., 1901, pg. 355.)

Manitoba and Northwestern Ry.—See under C.P.R. Betterments, Construction, etc.

The Manitoba Water Power Electrical Co. is the title of the Co. referred to as the Winnipeg General Power Co. on pg. 148 of our April issue.

Manitoulin and North Shore Ry.—Tenders have been asked for the construction of the following sections: from Meaford, Ont., to Owen Sound, 22 miles; from Wiarton to Tobermory, about 50 miles; from Whitefish bay to a junction with the C.P.R., Sault Ste. Marie branch, about 16 miles; and from Sudbury to Lake Wahnapitae, about 20 miles.

At the last session of the Dominion Parliament the Co. was authorized to issue bonds to the extent of \$30,000 a mile, instead of \$20,000, as authorized by the act of 1900. (April, pg. 141.)

Medicine Hat and Northern Alberta Ry. Co.—J. Cochrane, D. Lockerby, Montreal; F. R. Latchford, H. B. McGivern; Ottawa; and F. H. Phippen, Winnipeg, were incorporated at the recent session of the Dominion Parliament under the above title, for the purpose of constructing a railway from Medicine Hat, on the C.P.R. main line, north-westerly to range 16, west of the 4th meridian, thence northerly in the vicinity of ranges 16 and 17, west of the 4th meridian, to near Victoria, on the North Saskatchewan, with branches not exceeding 50 miles in any one case. The Co. may enter into agreements with the C.P.R. Co. and the Canadian Northern Ry. Co. for the sale of its undertaking. (Feb., pg. 58.)

The Medicine Hat Ry. and Coal Co. was

incorporated by the Dominion Parliament in 1886, and in the following year it was granted a land subsidy of 6,400 acres a mile for the construction of a railway from Medicine Hat to the coalfield in townships 12 and 13, range 6, west of the 4th principal meridian. The charter was revived, and the Co. authorized to extend its line to the International boundary between ranges 1 and 8 west of the 4th principal meridian. The time for the construction of the line has been extended from time to time, and at the recent session of the Dominion Parliament a further extension until 1907 was granted. (Feb., pg. 58.)

Michigan Central Rd.—President Ledyard recently informed the Windsor, Ont., board of trade that a new station would be built in that town, possibly this year. The Co., he said, would spend \$500,000 this year in improving the line in Canada.

The track between Cornell and Springfield, Ont., 16 miles, is being relaid with 80-lb. steel rails, and some double tracking is being done.

Middlesex and Elgin Interurban Ry. Co.—Surveys are reported to have been completed for the construction of the Co.'s projected electric railway from St. Thomas to Port Stanley, Ont., by J. A. Bell and — McCubbin. The route proposed to be followed is through Pinafore park, St. Thomas, and across two adjoining farms to the gravel road, and along the east side to Port Stanley. (April, pg. 141.)

Midland Ry. of Nova Scotia.—We were recently informed that nothing had been decided as to the proposed extension of the line from Truro to Brule, or with respect to an extension from Windsor to Middleton, but that decision was expected to be arrived at shortly thereafter. The M. Ry. Co.'s charter covers both these extensions. (April, pg. 141.)

Montford and Gatineau Colonization Ry.—Owing to three extensive landslides, April 19, traffic was suspended on the line except between Montford Jct. and Morin, about 8 miles. The whole trestle work on the remaining 25 miles to Arundel was swept away by the flood. The repairs were expected to be completed by the end of May. (Feb., pg. 59.)

The Montreal and Southern Counties Ry. Co. was incorporated by the Dominion Parliament in 1897 to construct a railway from the northern limit of the county of Chambly to Sherbrooke, to be operated by electricity or any other mechanical power but steam, and with power to enter into agreements with other

companies. At the recent session of the Dominion Parliament the act was so amended as to give the Co. power to operate by steam, and to connect its line with those of any other company along its route, and to arrange with the G.T.R., the C.P.R., the Richelieu & Ontario Navigation Co., or any company having a bridge across the St. Lawrence at Montreal, to cross the river. (April, pg. 143.)

Montreal-Longueuil Bridge.—The different propositions made at the recent session of the Dominion Parliament for the construction of a bridge over the St. Lawrence connecting Montreal and Longueuil, Que., failed to pass. The Montreal Bridge Co.'s application for an extension of time for the construction of their bridge, was refused by the Railway Committee of the House of Commons, and confirmed by the House; the bill was re-introduced in the Senate and passed, but it was not proceeded with beyond the second reading in the House of Commons. The application for the incorporation of the Montreal and St. Lawrence Bridge Co., with which the names of A. L. Meyer and R. J. Campbell, of New York, who are associated with the Dominion Securities Co. of New York, produced some heated discussions. The bill failed to pass the House of Commons. The notices of application for power to build bridges, given by Greenshields, Greenshields & Heneker on behalf of the Montreal Union Bridge Co., and by Archer & Perron, were not proceeded with. (April, pg. 141.) See also Montreal Subway Co.

Montreal Street Ry.—A double track is being laid from the corner of Mount Royal, along Park ave. to Van Horne ave.; the Amherst belt line is being completed, and work is in progress on a line through Place d'Armes square, to connect the Notre Dame and St. James st. lines. Track has been laid along Commissioner st., and the difficulties arising on account thereof have been practically settled between the M.S.R., the city council and the Harbor Commissioners. New routes have been opened along Ontario st., and out to Verdun. It is reported that arrangements will shortly be completed with the G.T.R., by which the M.S.R. will be enabled to run its cars across Victoria bridge and reach St. Lambert. (Feb., pg. 59.)

Montreal Subway Co.—R. Mackay, R. Reford, H. Miles, D. White, W. Price, J. Sharples, L. M. Jones, H. A. Hodge and A. E. Ames were incorporated under this title at the last session of the Dominion Parliament.

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to construct a subway under the St. Lawrence, with the necessary approaches in Montreal, and on the south side of the river, and branch lines to connect with the various lines on either side. For this purpose the Co. is given power to make the necessary agreements with the several railways. The capital is fixed at \$5,000,000, and power is given to issue bonds to the extent of \$5,000,000 on the subway, and up to \$50,000 a mile on its railways.

H. A. Hodge, President of the Quebec Southern Ry., and one of the principal promoters of this Co., states that plans have been prepared, that work will be commenced within 90 days after they are approved, and the undertaking completed within five years. The tunnel will commence at the South Shore Ry. near Longueuil, pass under St. Helen's island, and into Montreal to a central point in the east end, where a central station will be erected, and thence to the north side of the city, where connection will be made with the other railways. The subway will in reality be a double one, for there will be two tubes, each 27 ft. wide and 21 ft. high. That for cars, passengers and freight, will be double tracked. The second will be for teams and pedestrians, having drive and footways. It is estimated that the cost will range from \$4,000,000 to \$6,000,000. According to present plans the structure will be solid concrete and masonry, lined with white enamelled brick, and lighted with electricity. All the motive power will also be electricity, electric locomotives being utilized to haul the railway trains.

The Montreal Terminal Ry., formerly the Montreal Island Belt Line Ry., now extends from Hochelaga to Bout de l'Isle, and an extension is to be constructed into the city to the corner of Craig st. and Hotel de Ville ave., about 6 miles. This is expected to be built this year, the terms of a 10 years' franchise having been agreed on between the M.T. Ry. Co. and the city. (April, pg. 143.)

The Morden and Northwestern Ry. Co. was incorporated by the Manitoba Legislature in 1901, to construct a railway from the international boundary to Morden, thence via Miami to Treherne, Carberry and Neepawa, thence to the boundary, with branches from Morden to the International boundary south of Snowflake, and from Morden to Winnipeg, and from this branch into Carman. At the recent session of the Legislature the Co. was given power to sell to or amalgamate with the Canadian Northern Ry. Co. (May, 1901, pg. 157.)

Muskoka Electric Railway.—A proposal is being considered for the construction of an electric railway from Maple Lake station, on the Canada Atlantic Ry., along Lake St. Joseph to Port Cockburn and Rosseau, Ont., about 12 miles. Two waterfalls along the projected route would furnish all the power necessary.

Nepigon Ry. Co.—F. S. Wiley, J. Whalen, Port Arthur, Ont.; N. W. Rowell, J. G. Shaw, Toronto; P. Weidner, Detroit, Mich., and M. B. Lloyd, Minneapolis, Minn., were incorporated under this title at the recent session of the Dominion Parliament, to construct a railway from Nepigon station, on the C.P.R.'s transcontinental line, to James Bay. The Co. is being promoted in connection with the Nepigon Pulp Co.'s undertaking. (Jan., pg. 4.)

New Brunswick Coal and Ry. Co.—In the N.B. Legislature recently Hon. Mr. Tweedie stated that the Government had entered into an agreement with this Co., by which its bonds were guaranteed. The first 15 miles were under contract, but tenders for the remaining 30 miles had not been submitted to the Government. A provisional contract had been entered into with the Dominion Government, by which 60,000 tons of coal were to be purchased annually from the Co. Arrangements had been made for the operation of the line from Norton to Gibson by the

N.B.C. & R. Co. as one line, an option having been obtained on the Central Ry. of N.B., 45 miles in length, from Norton to Chipman at \$4,000 a mile. It was proposed to pay for this line by the issue of 6% 1st mortgage bonds.

Grading is proceeding rapidly on the line between Chipman and Newcastle, 15 miles, and J. Barnes, M.L.A., the contractor, states that track will be laid during the summer. It is reported that the James Barnes Construction Co. (Ltd.) has been given the contract for the construction of the 30 miles from Newcastle to Gibson. (April, pg. 143.)

The Niagara, St. Catharines, and Toronto Ry. Co., was given power at the recent session of the Dominion Parliament to acquire and hold or sell the bonds or securities of other electric railway companies; and to issue bonds to the extent of \$250,000 on its miscellaneous property. It was given an extension of time for three years to extend its line to Hamilton, and five years to extend its line from Hamilton to Toronto. (April, pg. 143.)

Nipissing and James Bay Ry.—It is not likely that there will be any construction done this season. (Jan., pg. 4.)

Nipissing and Ottawa Ry. Co.—J. Pearson, W. Clark, J. H. Denton, Toronto; and J. H. Taylor, York Township, were incorporated under this title at the recent session of the Dominion Parliament to construct a railway from the south-east end of Lake Nipissing across the township of Ferris to Trout lake; thence through the townships of French and Phelps to the Ottawa river, near the Opepican river. The Co. was also given power to carry on a general navigation business on navigable waters opened up by its line; and also to enter into agreements with the C.P.R., the G.T.R., or other railway companies for amalgamation or otherwise.

Northern Colonization Ry.—See under C.P.R., Betterments, Construction, etc.

North Shore Power Ry. and Navigation Co.—W. and J. Clarke, T. Meaney, Toronto; J. and G. Clarke, of New York city, were incorporated under this title at the last session of the Dominion Parliament with power among other things, to construct a railway to be operated by steam or electricity from Seven Islands Bay, on the St. Lawrence river, to the Co.'s works on Ste. Marguerite river, not exceeding 10 miles. It is stated that \$1,000,000 will be expended on the erection of a pulp mill, and other works during the year.

Nova Scotia Eastern Ry.—M. H. Fitzpatrick recently drove over a suggested route for the line by the shore to Musquodoboit Harbour, and thence up the valley. The Dartmouth Board of trade favors this route. It passes through a well settled country, and the only objection to it is said to be its length. (April, pg. 143.)

The Nova Scotia Steel and Coal Co., in addition to its line from Ferrona Jct. to Sunny Brae, N.S., 12.5 miles, has a line 5.15 miles in length, which is used for colliery purposes only, to convey coal from the old Sydney mines, in the town of Sydney mines, to the shipping pier at North Sydney; and which is connected with the I.C.R. by a short branch line to North Sydney station. It is to be relaid this year with 80-lb. rails.

Ontario Electric Co.—The projected route of the electric railway authorized to be constructed by this Co. between Toronto and Ottawa, passes through 47 townships, and they are being asked to give a free right of way and exemption from taxation for at least 20 years. G. E. Sleeper, C.E.; A. D. Dowd; G. E. Smith, of Boston, and J. Carson, Kingston, Ont., have been driving over the route, and it is reported that plans are about completed, and that work will be commenced on

the section between Kingston and Brockville this year. (April, pg. 144.)

The Ontario, Hudson's Bay and Western Ry. Co., which has Dominion and Provincial charters to construct a railway from Sault Ste. Marie, Ont., to Hudson's bay, was at the recent session of the Dominion Parliament granted an extension of 10 years within which its line may be constructed. Its Provincial charter was amended at the last session of the Ontario Legislature, by extending the time for the commencement of construction to 1905, and completion to 1910. (Feb., pg. 60.)

The Orford Mountain Ry. Co. was, at the recent session of the Dominion Parliament, granted until 1907 to construct the lines authorized in its act of incorporation, Quebec statutes, 1888, chap. 98. At the recent session of the Quebec Legislature, the time within which the Co. may complete its undertaking was extended to Dec. 31st, subject to the conditions contained in 62 Vict., sec. 4, chap. 4. (May, 1901, pg. 157.)

The Ottawa, Brockville and St. Lawrence Ry. Co. was incorporated by the Dominion Parliament in 1900, with power to construct a railway from Ottawa to Brockville, Ont., and operate a ferry service on the St. Lawrence between Brockville and Morris-town, N.Y. The Co. may amalgamate with the Ottawa Electric Ry. Co., the Canada Atlantic Ry. Co., the C.P.R., the G.T.R., or the Brockville, Westport and Sault Ste. Marie Ry. Co., and was authorized to develop electrical power, but was prohibited from operating street railway lines in Ottawa and Hintonburg. At the recent session of the Dominion Parliament an extension of time until 1904 was granted for the commencement of the lines. (Aug., 1900, pg. 241.)

Ottawa Electric Ry. Co.—An arrangement has been made with the City Council for the improvement of Bank st. by laying 72-lb. rails, work to commence in July. The Council has granted permission to the Co. to lay a single track on George st., between Dalhousie and Sussex streets.

Ottawa Northern and Western Ry.—Some preliminary work was done a year or two ago on the extension to Maniwaki, and since the line passed under the control of the C.P.R. a contract has been let to H. J. Beemer to construct the 23 miles to that point from the present terminus at Gracefield. Sub-contracts have been let to D. R. McDonald, R. L. McDonald, and A. F. Mulhern, for grading, track laying, ballasting, etc. The grading, although by no means a light contract, will not be as heavy as some of the sections already constructed on the line. There will be no bridges, there being only a few small streams to cross. Both the gradients and the curvature will be light as compared with other sections of the line. G. C. Dunn, formerly Chief Engineer O.N. and W. Ry., will have charge of construction. (May, pg. 162.)

Pacific, Northern and Omineca Ry. Co.—J. Irving, H. F. Bullen and F. B. Gregory of Victoria, B.C., were incorporated under this title at the recent session of the Dominion Parliament, to construct a standard gauge railway from Kitimaat Inlet, B.C., via Hazelton, to Teslin Lake; also from Hazelton, via the Omineca and other rivers, to Peace River Pass, and thence to Edmonton, Alta.

At the current session of the B.C. Legislature an Act was passed authorizing the P.N. and O.R. Co. to construct in addition to its other lines a branch from near Hazelton to the junction of the Bulkley and Telqua rivers, and to issue bonds to the extent of \$35,000 a mile on its lines. (Jan. pg. 4.)

Peterboro.—Tenders were recently invited for the construction of a concrete dam and railway bridge at Peterboro, for the American Cereal Co. C. H. Keefer, C.E., Ottawa, is the engineer in charge.

Peterboro and Ashburnham Street Ry.—A Detroit syndicate has acquired the property and franchises of this Co., and the town council has recommended that a 30-years' franchise, with exemption from taxes for 21 years, be granted the purchasers. Mr. Bene, President of the National Construction Co. of Detroit, is interested in the purchase, and it is reported that the line, which has not been operated for about three years, will be put in order, and that cars will commence running again by July 1. It is reported that extensions will be built to Lakefield, 10 miles, and to Chemong Park, 6 miles. (Feb., pg. 60.)

The Port Dover, Brantford, Berlin and Goderich Ry. Co. was authorized at the last session of the Dominion Parliament to change its name to The Grand Valley Ry. Co. The capital of the Co. is \$1,000,000, and bonds may be issued to the extent of \$30,000 a mile.

At the organization meeting held in Galt, May 19, the following directors were elected: President, J. G. Wallace, Woodstock; Vice-President, W. B. Wood, Brantford; Secretary-Treasurer, J. H. Armstrong, Woodstock; other directors: D. W. Karn, H. H. Powell, Woodstock, and W. Turnbull, Brantford.

Surveys are in progress on the section of the line between Brantford and Paris, Ont.; and a contract has been let to the Von Echa Construction Co. for the construction of the line from Brantford, via Paris, Blue Lake and St. George, to Galt. It is expected that the line will be completed to Paris in six months. The head office of the Co. is to be located in Brantford. (April, pg. 145.)

Preston and Berlin Street Ry. Co.—J. Patterson, of Hamilton, is authority for the statement that the construction of the line from Berlin to Preston, Ont., will be commenced early this spring. The Berlin town council has granted Mr. Patterson the necessary right of way in that town, a condition being that the line is to be completed by Aug. 1. (May, 1900, pg. 148.)

Prince Edward Island Ry.—At the recent session of the Dominion Parliament \$30,000 was voted for the purpose of increasing the accommodation at Charlottetown. It is not intended to build a new station at Alberton this year as stated in press reports.

In the House of Commons, May 6, the Minister of Railways stated that W. Kitchen, the contractor for the first 11½ miles of the extension of the line from Charlottetown to Murray Harbor, had been given the contract for the remaining 31½ miles without tender.

The schedule of prices for this additional work was the same as on the original contract, and his action in so placing the contract was approved of by the Cabinet. The prices were reasonable, the contractor was a responsible man, and members of Parliament had pressed for the work to be done. (April, pg. 145.)

Quebec Bridge.—As previously stated, the north abutment, north anchor pier and main pier on north side of channel are completed. At the end of April we were advised that the caisson for the main pier was expected to be completed ready for launching early in May, and that it would be towed to the site of the bridge as soon as the bottom of the river had been dredged level to receive it. No decision has been arrived at respecting the construction of lines connecting with the bridge, or the terminal in Quebec. (Jan., pg. 5.)

Quebec Central Ry.—We are officially informed that it is not intended to construct the projected branch from Scott's to South Quebec, about 25 miles, this year. Surveys will probably be made and plans prepared this season, and construction is likely to be gone on with next year. (Feb., pg. 60.)

The Quebec and Lake Huron Ry. Co., which was incorporated in 1900 to construct a railway from Quebec city to the mouth of French river, Ont., was given permission at the recent session of the Dominion Parliament to lay a third rail on its projected line in order to have a 6 ft. as well as a standard gauge track. It was also given an extension of time for seven years within which it may complete its line.

At an organization meeting held in Quebec the following directors and officers were elected: President, F. Campbell, Bath, N.Y.; Vice-President, Hon. A. Turgeon, Quebec; other directors: R. Larue, J. D. Cameron, C. A. P. Landry, Quebec; J. Drake, New York city; Hon. H. G. Carroll, Fraserville, Que.; Treasurer, H. G. Hablo, New York city; Secretary, Hon. C. Langlois, Quebec. Press reports state that a contract has been let for the construction of the line to R. J. Campbell, of New York, who is reported to have stated that operations will commence at once, and the line will be completed in three years. The surveys, he said, had not been made, but the road will practically follow a straight line, and be 440 miles in length, 335 of which will be in the Province of Quebec and 105 in that of Ontario. At the mouth of the French river it will connect with navigation on Lakes Huron,

Michigan and Superior. R. J. Campbell is vice-president of the Cape Breton Ry. Co., and was associated with W. Seward Webb, President Rutland Rd., A. L. Meyer and others in the original purchase of the South Shore Ry., the Canada Atlantic Ry. and other Canadian companies, which it is understood were being or about to be financed by the Dominion Securities Co. of New York. No subsidy has been voted for this road, and we think any statements as to early construction are at least premature.

The Co. is reported to have deposited \$125,000 with the Quebec Government as an evidence of good faith. (Aug., 1900, pg. 243.)

Quebec Ry., Light and Power Co.—The city of Quebec entered an action in the Recorder's court to recover \$3,000, being a penalty of \$40 a day for 75 days during which the Q.R.L. and P. Co. had failed to construct an electric railway along Champlain st. The Co. took exception to the jurisdiction of this court, but was over-ruled. The Co. appealed to the Superior court and Justice Andrews has given a decision in its favor, and issued a writ ordering proceedings to be discontinued.

The Quebec Southern Ry. Co. was given power at the last session of the Dominion Parliament to construct a railway from St. Robert to Levis, about 90 miles, and to acquire by purchase or lease other lines, which shall be considered as forming part of the Q.S. Ry. as if they had been built by the Co. (Feb., pg. 60.)

The Red Deer Valley Ry. and Coal Co. was incorporated in 1889, to construct about 60 miles of railway from Calgary to the Kneehill coal beds, and from time to time the Co. has been granted an extension of time to construct the line, but no work has been done. At the recent session of the Dominion Parliament an application was made for a further extension of time, but the Railway Committee of the House of Commons reported that it was not desirable to renew the charter, which report was confirmed in the House. In the course of the discussion it was stated that the charter had been acquired by E. Rogers, J. Bain, and other Toronto people, that \$90,000 had been spent on surveys, etc., and that \$50,000 had been deposited with the Government. F. Oliver, M.P., of Edmonton, stated there was nothing in the district to show that even \$1 had been expended, and that all the Co. wanted was the grant of 350,000 acres which was made towards the construction of the line.

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HAMILTON, ONT., CANADA.

The River St. Clair Ry. Bridge and Tunnel Co. was granted the extension of time asked for at the recent session of the Dominion Parliament, in order to carry out its undertaking. (April, pg. 145.)

The Sandwich, Windsor and Amherstburg Ry. Co., which has 15 miles of track in operation, and extends out to Ojibwa, proposes to extend its line to Amherstburg, Ont., 13 miles further, and has asked for a bonus of \$20,000. It is thought that Amherstburg will offer \$10,000, but doubt is expressed as to the possibility of obtaining the other \$10,000 from the townships through which the line will pass. If the bonus can be raised it is said the line will be constructed this year. (Feb., pg. 61.)

Sault Ste. Marie Terminals.—It is reported that arrangements have been completed between the C.P.R. and the Algoma Central and Hudson's Bay Ry. Co. for the erection of a \$50,000 union station at Sault Ste. Marie. The suggested site is on Cathcart and Hudson streets, and the ground is being cleared for the building.

The Schomberg and Aurora Ry. is being constructed by the Metropolitan Ry. Co., from Bond Lake, 17 miles from Toronto, to Schomberg, a distance of about 15 miles. Grading is all but completed, and track has been laid for a considerable distance from Bond Lake. The line is expected to be completed and open for traffic by July 1. The application for an act to enable the township of King to pay a subsidy to the line, although it was not completed within the time prescribed, was not proceeded with at the last session of the Ontario Legislature. (Feb., pg. 61.)

The Shawinigan Falls Electric Ry. purposes adding several miles to its present tracks in the town and district. The proposed extension is in connection with the erection of a new electro-chemical industry, which has obtained 10,000 h.p. from the Shawinigan Water and Power Co.

South Shore Ry.—The contracts for the completion of the authorized extension from Sorel to Chaudiere, Que., have not been let. It is reported to be desired to have the extension, which will cost about \$2,000,000, completed by Sept. 1. E. Lantier, C.E., the Co.'s Chief Engineer, prepared the plans and specifications, and will have the superintendence of the work. The work proposed to be done under the contract is to complete the line from St. Gregoire to Chaudiere; as the Co. has the other work, including the bridging of the St. Francois river at Nicolet, nearly completed.

H. A. Hodge, President, denies the reports that the line has been acquired by the Rutland Rd., and that the Co. is negotiating for the Lotbiniere and Megantic Ry.

At the last session of the Dominion Parliament the titles of the old Montreal and Sorel Ry., of the old Montreal and Atlantic Ry.; and of the old Great Eastern Ry., were vested in the S.S. Ry. Co., and the Co. was authorized to issue bonds secured on these lines, and to arrange for converting its mortgage bonds and debentures into preference stock. (April, pg. 145.)

The Southwestern Traction Co. has elected the following directors: President, F. G. Rumball; 1st Vice-President, Lt.-Col. Leys; 2nd Vice-President, R. McEwen; Managing Director, A. E. Welch; other directors, Dr. McKay, Ingersoll; T. E. Robson, T. H. Purdom, T. H. Luscombe and G. C. Elliott. The Co. has secured a franchise for 50 years, with exemption from taxation, through the township of Westminster, Middlesex county, Ont. It is proposed to build the line from London to Delaware village, but the Delaware township council has not yet granted a franchise. (April, pg. 145.)

The St. John, N.B., Ry. has been granted permission by the city council to extend

its tracks on Douglas ave., it being stipulated that T rails of not less than 70 lbs. a yard be laid. (April, pg. 145.)

The St. Lawrence and Northern Ry. Co. was incorporated at the recent session of the Dominion Parliament in accordance with the terms of the notice of application. (April, pg. 145.)

St. Mary's River Ry.—We were recently informed that it had not been decided whether the line would be extended from its present terminus at Spring Coulee, Alta., this year or not.

Strait of Canso Bridge Co.—R. G. Reid, Montreal; A. G. Ross, Sydney, N.S.; G. Fraser, New Glasgow, N.S., and H. Donkin, Antigonish, N.S., were incorporated at the recent session of the Dominion Parliament, under this title, with a capital of \$5,000,000, to construct a bridge over the Strait of Canso, near Port Hastings, N.S., together with the necessary approaches, and to construct one or more lines of railway to connect the bridge with existing or future lines on either side of the strait. It is enacted that the Government shall make regulations providing for security of navigation of the strait, and power is given to amalgamate with other companies. (Feb., pg. 61.)

Suburban Rapid Transit Co.—The following officers were elected at the organization meeting at Winnipeg, Man., April 30:—President, Hon. H. J. Macdonald; Vice-President, W. L. Harrison; Treasurer, W. Georgeson; Secretary, E. S. Harrison. Preliminary surveys have been made for the projected line from Winnipeg to Headingly, and it is reported that construction will be commenced at an early date. (April, pg. 145.)

The Sydney and Glace Bay Ry. Co. was incorporated at the recent session of the Nova Scotia Legislature. The Co. has been formed in pursuance of an agreement between the Cape Breton Electric Co., and the Dominion Coal Co., which each claimed to have the right to construct an electric railway from Sydney to Glace Bay, each holding one-half of the stock. It is reported that the construction of the line, for which all the necessary franchises have been obtained, will be proceeded with at once. (April, pg. 145.)

Sydney and Louisburg Ry.—It is proposed to change the route of this line at Mira gut by bringing it further inland so as to prevent damage by the sea in rough weather. (April, pg. 145.)

Temagami Ry.—At the recent session of the Dominion Parliament an extension of time was granted within which the line is to be commenced and completed. We are officially informed that it is not likely that anything will be done in the way of construction in the immediate future. (April, pg. 145.)

Temiskaming and Northern Ontario Ry.—The appointment of commissioners who will have charge of the construction of this line from North Bay, Ont., for the Ontario Government, had not been made up to May 31.

Profiles have been received by the Ontario Commissioner of Public Works, for a route from North Bay to the head of Lake Temiskaming, and for the first 20 miles of an alternative route. The first sod of the new line was turned by the Commissioner May 10, at a point about three miles north of North Bay. A contract for clearing the right of way for the first 20 miles of the projected route via Trout Lake has been let. (April, pg. 145.)

The Tilsonburg, Lake Erie and Pacific Ry. Co. was given at the recent session of the Dominion Parliament the necessary extension of time in order to complete its line into Ingersoll, and was authorized to extend the line within five years to Collingwood on Georgian Bay. (April, pg. 147.)

Toronto Radial Railways.—The Toronto city council recently passed the following resolution: "That as it is expedient that means should be provided for the carriage of freight from the various electric lines centring in Toronto to the water front and to St. Lawrence market, that the City Engineer be instructed to ascertain upon what terms the Belt Line Ry., owned by the G.T.R. Co., can be obtained by the city for the purpose of furnishing a freight line for all radial electric railways centring in Toronto."

Trans-Canada Ry. Co.—By an act passed at the recent session of the Dominion Parliament, the act incorporating a company under this title was revived in favor of the following: G. E. Church, R. B. Martin, F. Crisp, of London, Eng.; Hon. F. Clemow, J. A. Gemmill, Ottawa; G. Tanguay, J. T. Ross, G. LeMoine, V. Chateauvert, J. G. Scott, W. Price, W. A. Marsh, T. A. Piddington, Hon. P. Garneau, V. Boswell, W. Shaw, Hon. N. Garneau, L. A. Robitaille, N. Rioux, E. Baudet, E. E. Ling, A. E. Doucet, Hon. Jules Tessier, Guy Tombs, A. Hardy, S. S. Oliver, Quebec; B. A. Scott, Roberval; G. T. Davie, Levis; J. G. Guay, J. E. A. Dubec, Chicoutimi; J. Girard, St. Gédéon; O. Coté, St. Alphonse; W. Hanson, Montreal; Jas. McNaught, New York city, and H. H. Melville, Boston, Mass. The Co. is authorized to enter into arrangements for amalgamation, etc., with the Great Northern Ry. of Canada, the Quebec and Lake St. John Ry., or the Canadian Northern Ry.

The projected route is claimed to reduce the distance between Quebec and the Pacific ocean by 248 miles, and obviate the steep grades on more southern lines. The Peace river pass is 2,000 ft. high, and the summit between the St. Lawrence and James Bay is 1,200 ft. above sea level. The line through practically its whole distance will be about 300 miles north of the International boundary, and will open up for settlement an absolutely new and undeveloped country. (April, pg. 147.)

The United Gold Fields of B.C. (Ltd.), a British corporation was authorized, at the last session of the Dominion Parliament, to construct a railway from Frank, on the C.P.R. Crow's Nest pass line, northerly to Grassy Mountain, with branch lines not exceeding 8 miles in any one case, in order to connect with navigable water, or with any other railway co. (Feb., pg. 62.)

The United Towns Electric Co. was incorporated at the last session of the Newfoundland Legislature, with power among other things, to construct an electric railway in the towns of Harbor Grace, Carbonear and Hearts Content, and for 10 miles on each side.

Vancouver and Coast-Kootenay Ry. Co.—L., H. and N. McLean, of Vancouver, are applying for incorporation at the current session of the B.C. Legislature under this title for the purpose of constructing a railway from Vancouver, eastward via New Westminster by the most feasible route, wholly in B.C., to near Midway, in the Boundary Creek district, and from New Westminster to the mouth of the Fraser river to connect there with the Victoria Terminal Ry. and Ferry Co., or other ferries, with power to construct a branch from the main line northerly to Nicola lake. This bill was introduced after the Commissioner of Public Works had informed the Legislature that the Government had entered into an agreement with the McLean Bros. for the construction of such a line in return for a subsidy of \$4,000 a mile for 230 miles, and \$4,800 a mile for 100 miles, and 1,000,000 acres of land in addition to a free right of way; the contractors to complete the line in four years, or forfeit \$100,000. The bill ratifying this agreement met with considerable opposition and was withdrawn, and an-

other one introduced May 20. This provides for a subsidy of \$4,500 a mile for the whole line, but without a land grant, freedom from provincial and municipal taxation for 10 years; thereafter the Co. is to pay the Government 2% of its gross earnings in lieu of taxation. The rates are to be under Government control; work must be started within three months after satisfactory assurance of Dominion aid is obtained, or before Sept. 1, 1903.

The only other offer received by the Government for the construction of this line, the Commissioner of Public Works told the Legislature, was from the Ollala Copper Mining and Smelting Co., a New York corporation. It offered to construct the line for a subsidy of \$4,000 a mile and the Dominion subsidy, but without a land grant. This Co. has acquired the charter of the Similkameen and Keremos Ry. Co., incorporated in 1901 by the Dominion Parliament to construct a line from Penticton to the boundary, and up the Similkameen valley to Princeton. (May, 1901, pg. 157.) A circular respecting the O. C. M. and S. Co., referred to by the Victoria Colonist, represents it as having a capital of \$8,000,000, as being backed by unlimited capital in New York, and offers its \$25 shares at \$12.50 each, payable \$5 down and the balance in easy instalments.

The Vancouver, Victoria and Eastern Ry. and Navigation Co.'s application for an extension of time within which it may construct its line, was granted at the recent session of the Dominion Parliament. There was no opposition on the part of the Kettle Valley Line which has been fighting the Co. in the courts of B.C. and Washington. The Attorney-General was made a party to the actions in B.C. by order of the court, and on April 24 he stated in the House that meetings between the parties interested were being held, and satisfactory settlement would probably be secured. A later report stated that the contractors had men at work on both sides of the line, south of Grand Forks, on the section of the line between Grand Forks, and Republic, Wash., notwithstanding the injunction, and that it was expected to have the work completed at an early date. The B.C. injunction was dissolved May 1. The other portions of the line making a connection, via Grand Forks, B.C., between Marcus and Republic, Wash., have been completed.

We are advised that it has not yet been decided what amount of work will be done this year, but it is contemplated to do considerable construction westward. The location sur-

veys are completed as far westward as the summit between the Kettle and Okanagan rivers, 40 miles west of Midway, B.C. (April, pg. 147.)

Vancouver and Westminster Ry.—The B. C. Legislature at its current session granted a year's extension from Aug. 31, 1902, for the commencement of this line, and three years' extension from the same date for its completion. (Feb., pg. 62.)

The Velvet (Rosland) Mine Ry. Co. was incorporated at the recent session of the Dominion Parliament, the head office being fixed in Rosland, B.C., to construct a railway from the Velvet mine to Rosland, and thence to the International boundary. The Velvet Rosland Mine (Ltd.) has been registered under the B. C. Companies' Act, as an extra provincial company, its attorney being S. S. Sorensen of Rosland, and is authorized among other purposes to construct such railways as may be deemed expedient for its purposes. (April, pg. 147.)

Victoria Terminal Ry. and Ferry Co.—Track has been laid from the terminus of the Victoria and Sidney Ry. to the old market building, now the Victoria Terminal station, in Victoria, B.C., and the V. and S. trains are now operated over it. (April, pg. 147.)

Western Alberta Ry. Co.—An application was made at the recent session of the Dominion Parliament for an act granting a further extension of two years within which construction might commence on the Co.'s line from the International boundary, to the middle fork of Old Man's river, thence to Canmore and Anthracite, and via the Cascade and Red Deer rivers to the north Saskatchewan and on to the easterly base of the Rocky Mountains. It was also proposed to change the location of the beginning of the line from west of range 20, west of the 4th principal meridian, to west of range 14, etc. The bill was passed by the Senate, but was thrown out in the House of Commons at the end of the session.

Whitney to Big Openogo Lake.—A logging railway is reported to be under construction for the Whitney Lumber Co. from Whitney, Ont., on the Canada Atlantic Ry., northerly for 15 miles to Big Openogo lake. It is expected to be completed by July 1. T. McLaughlin, Ottawa, is the contractor.

The Windsor and Detroit Union Bridge Co. was granted an extension of five years within which it may commence its bridge between Windsor and Detroit, at the last ses-

sion of the Dominion Parliament (April, pg. 148.)

Windsor, Essex and Lake Shore Ry.—Some differences of opinion have arisen between the Co. and the Windsor city council respecting the terms upon which a franchise would be granted, and the matter is still under consideration. Surveys are in progress for the line from Windsor through Maidstone, Essex, Cottam and Leamington and Wheatley. (April, pg. 148.)

The Winnipeg Electric Street Ry. Co. has made application to the city council for permission to extend its tracks from Sherbrooke st. to Empress st., and it is reported that application will be made to the municipality of Assiniboia for power to lay tracks to Deer Lodge, Silver Heights. (April, pg. 148.)

Winnipeg General Power Co.—This title was not given by the Manitoba Legislature at its last session to the Manitoba Water Power Electrical Co., as stated in our last issue, but to the Winnipeg River Power Co. (April, pg. 148.)

The Woodstock, Thames Valley and Ingersoll Electric Ry. has opened an office at the corner of Dundas and Broadway streets, Woodstock.

Yukon Pacific Ry.—D. B. McBean, J. Fleming, T. L. Metcalfe, W. H. Moore, and D. K. Elliott, Winnipeg, Man., were incorporated under this title at the recent session of the Dominion Parliament to construct a railway from Whitehorse to near the Chilkat river within five miles of the international boundary line between B. C. and Alaska. The capital is fixed at \$1,000,000, and the Co. may issue bonds to the extent of \$30,000 a mile.

The daily press recently stated that C. M. Hays, 2nd Vice-President and General Manager, was arranging for a new system of rules on the G.T.R., by which promotions were to be made from the ranks, and that in making appointments from outside, preference was to be given to applicants living along the line. The object of this, it was stated, was to give the young men on the line promotion according to seniority, providing they proved themselves qualified for the duties and responsibilities involved. We are informed that the rule in question has been followed ever since Mr. Hays took charge of the G.T.R., providing the men available were competent to fill the position, and that the majority of promotions have been made from the ranks in recent years.

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Canadian Northern Ry. Construction.

General Powers—At the recent session of the Dominion Parliament this Co. was given power to construct a line easterly from some point on its line between Port Arthur and Fort Frances to the city of Quebec, with branches from suitable points into Port Arthur, Ottawa and Montreal, such lines to be commenced within five years, and completed within 10 years. It was also authorized to construct a line from its existing line at McCreary, Man., southerly to the international boundary in Manitoba; and to complete its line to the Pacific coast from the narrows of Lake Manitoba to Edmonton, thence to the Skeena river via the Pine river pass, with a branch in Alberta from between Beaver and Birch Lakes to the Red Deer river district; and a branch in Saskatchewan from the north elbow of the Saskatchewan river to Pas Mission, on the Carrot river. The main line is to be commenced in two years and completed in five years, and the branch lines are to be commenced in three years and completed in six years. The Pine river pass route is the one surveyed by Sir Sandford Fleming for a transcontinental route and reported by him to be only available for a single track. In the discussion on the bill the Minister of Railways stated that the general railway act provided for the use of any track that might be constructed through this pass. The Co. asked for power to construct an alternative line from near Swan river to a point between Edmonton and the Yellowhead pass, but this clause was withdrawn. The capital of the Co. was increased from \$24,750,000 to \$35,000,000, and it was authorized to issue bonds to the extent of \$25,000 a mile on the proposed extensions and branches. It was also authorized to amalgamate with its undertaking the charter of the Morden and North-Western Ry. Co., and to give aid to settlers upon lands in the districts served by it.

Port Arthur Elevator—On May 3, the bottom fell out of one of the storage bins, but this did not affect the working of the elevator. The repairs are completed. W. Mackenzie states that a new elevator having a capacity of 1,500,000 or 2,000,000 bush. will be erected. No contract has been let for this work. (April, pg. 127.)

Ontario Division—The ballasting of the line between Port Arthur and Rainy River is being rapidly proceeded with, five steam shovels having been employed for some time. While trains have been regularly run since the line was completed, a through fast service to Winnipeg is not expected to be started until early in June. (Feb., pg. 63.)

Winnipeg Terminals—Munson and Allan, solicitors, have given notice that the Co. intends making application to the Railway Committee of the Privy Council to sanction the construction of a line from the tracks of the Winnipeg Transfer Co. near May st., along the river front to Dewdney and Boyle streets, with a branch from Curtis street, to Higgins ave., east of Annabel st., with power to expropriate lands. (April, pg. 127.)

Winnipeg Shops—Representatives of the Co. have been inspecting a number of locomotive and car building and repairing shops in the U.S. The Co. intends enlarging its shops, roundhouses, etc., and it is reported that \$500,000 will be expended on improvements in this direction at an early date.

Branch to Oak Point—W. Mackenzie is reported to have recently stated in Winnipeg that work would be pushed on the reconstruction of the Winnipeg Great Northern line from Winnipeg to St. Laurent. Work will be started from Winnipeg. (April, pg. 127.)

Carman Branch—The branch from St. Charles, Man., on the Winnipeg-Portage la Prairie main line to Somerset, on the Morris-

Brandon branch of the Northern Pacific Co.'s lines, via Carman, is to be completed this year and a contract is reported to have been let to A. C. Mackenzie, Winnipeg. The length of the branch is approximately 75 miles, and of this 63.5 was constructed in 1901. Some difficulty has been experienced in Carman as to right of way, and when the matter came before the Railway Committee of the Privy Council a decision was given that the right of way should not be granted until the claims of the Bank of Hamilton and E. L. B. McLeod for damages are settled. (April, pg. 127.)

Gilbert Plains Branch—Work has been commenced at Grand View, Man., for the extension of this branch by Strevel & Son, Winnipeg, who have the contract for grading 50 miles westerly. No information is available as to whether this will be a portion of the main line. (April, pg. 12.)

Neepawa Branch—A contract has been let to Macdonald & McMillan, Winnipeg, for building the branch from between Golden Stream and Gladstone, authorized at the last session of the Manitoba Legislature. It is reported that work has commenced at Arden. Survey parties are working on the projected line north-west of Neepawa in the direction of the Riding mountains. (April, pg. 127.)

Erwood Westerly—The route proposed to be followed from the end of the grading about 20 miles beyond track end at Erwood, will be along the southerly portion of tp. 45, to Waterhen lake, thence north-westerly to Prince Albert. The point of crossing the South Saskatchewan river is not decided nor yet the route from Prince Albert to Battleford. There will probably be two crossings of the North Saskatchewan, and one of the southern branch of the river. Contracts for clearing the right of way have been let. It is reported that Neil Keith is at work west of the present end of grade, and that J. McIntosh, C.E., is laying out the work. (April, pg. 127.)

J. H. Wilson, Prince Albert, Sask., who was in Ottawa, looking after the interests of that district when the Co.'s bill was before Parliament, reports that it is the intention of the Co. to construct the line as far as the South Saskatchewan this year, and to carry the line into Prince Albert next year; that later on, when the line from Gilbert Plains is being constructed through to Battleford, there will be a branch into Prince Albert. This main line will cross the North Saskatchewan at the elbow, and will proceed north-westerly to Edmonton. H. Sutherland is authority for the statement that by the line of the C.N.R. Edmonton will be brought about 250 miles nearer Winnipeg than it is via the C.P.R. and the Calgary and Edmonton Ry. Location surveys are being prosecuted westerly from Prince Albert, and also easterly from Edmonton.

British Columbia Lines—The agreement entered into between Mackenzie, Mann & Co., representing the Edmonton, Yukon and Pacific Ry. Co., and the B.C. Government for the construction of a railway from Bute inlet, easterly to the provincial boundary, via the Yellowhead pass, with a line from Seymour narrows, into Victoria, referred to in our April issue, pg. 127, and May, pg. 169, met with considerable opposition in the B.C. Legislature, and the bill authorizing its ratification was dropped. On May 20, an amended bill was brought in for the purpose of aiding the construction of a railway from Victoria to Yellowhead Pass. This bill authorizes the Government to aid the construction of a railway from Bute inlet to Yellowhead Pass, about 480 miles, by a grant to the Edmonton, Yukon and Pacific Ry. Co., of \$5,000 a mile, to be paid in Provincial 3% stock at par, payable in 50 years. The agreement to be entered into calls for the construction of a standard gauge railway equal to the original construction of the C.P.R.; work to commence

at Bute inlet, within three months after a Dominion subsidy has been voted, or before Sept. 1, 1903; and for the establishment of a car ferry service from Bute inlet to Seymour's narrows as soon as 100 miles of track have been laid. The Government is to provide a free right of way; and gives freedom from all taxes for 10 years, from the completion of the line; after which the Co. is to pay 2% of its gross earnings in lieu of taxation. The head office of the Pacific division is to be maintained at Victoria; freight and passenger rates are to be subject to the approval of the Government, and the Co. has to deposit \$100,000 to be forfeited if the agreement is not carried out. As to the section of the line on Vancouver island the Government is authorized to enter into an agreement with the Victoria and Seymour Narrows Ry. Co. for the construction of a railway from Wellington to Seymour Narrows, via Alberni, not exceeding 150 miles, for which a subsidy of \$5,000 a mile will be paid, on the same terms and general conditions as in the case of the E. Y. and P. Ry. Co.

The act incorporating J. N. Greenshields, K.C., T. G. Holt, H. B. Robertson and J. Mitchell, under the title of the Victoria and Seymour Narrows Ry. Co. was passed by the B.C. Legislature, May 19.

Suggestions to the I.C.R. Management.

The Montreal Gazette says that the management of the Intercolonial Ry. thought recently it would be a good thing to learn the views of the suburbanites around St. John, N.B., as to how the service could be improved. Some of the suggestions received are unique. The following are samples:—

Suburbanite's I.O.U.'s to be taken by ticket agent for tickets when requested.

Ice boxes to be put in each end of car in which fresh meats, fish and other cold storage parcels may be placed while en route.

Parcels forgotten on train to be at risk of railway, and if not returned, the railway to pay owner at his valuation.

School children learning their lessons on train not to be disturbed by brakemen announcing names of stations aloud. Each passenger to be informed separately.

Conductors to have sufficient education to answer intelligently all knotty problems that the children are unable to unravel.

From a bachelor crank. All school children to be carried in a box car.

Weather bulletins to be posted in cars so that the public may expect the opposite.

Suburbanites missing noon train, railway to provide free meals in restaurant.

Canadian Society of Civil Engineers.

At the ordinary meeting, May 8, the following applications for admission and transfer were announced: For admission—J. L. Coulson, H. B. R. Craig, M. J. Haney, H. Idsardi, C. L. Trimmingham, W. P. Wilgor. For transfer from the class of associate member to the class of member—W. A. Clement.

A paper by J. S. Armstrong, M. Can. Soc. C. E., on "A General Railway Specification" was presented. It was decided to hold the discussion on this paper over until the first meeting in the autumn.

The Mica Boller Covering Co., Montreal, recently received an order from the DeBeers Explosives Co., West Somerset, South Africa, for mica covering. The M.B.C. Co.'s head office in London, Eng., has recently secured a very large contract for covering in England, and also a contract for covering the pipes and cylinders of another new battleship for the British navy.

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

Following are particulars of the principal works in the way of betterments for which appropriations have been made this year:

Atlantic Division.—The bay shore yards, St. John, N.B., will be altered and extended and the facilities for handling freight largely increased. Eight dwellings for Co.'s employes will be erected at McAdam Jct. Wooden bridges will be replaced by permanent structures; present sidings will be extended and new additional sidings constructed; embankments and cuttings will be widened; and ditching and fencing will be carried on to a large extent on various portions of the line.

Eastern Division.—A new station is being constructed at Ste. Agathe. A number of wooden bridges are to be replaced by permanent structures. Many of the present sidings will be extended and new additional sidings constructed. A large amount of 72 lb. rails now in the track will be replaced by new 80 lb. steel.

Ontario Division.—Extensive alterations and improvements will be made at Brampton. Embankments will be widened; wooden bridges will be replaced by permanent structures, sidings will be extended; and new additional sidings will be constructed.

Lake Superior Division.—The coal dock and coal handling plant at Jackfish will be greatly extended and improved. Four 55 ft. turntables will be taken out and replaced by 70 ft. turntables. Several bridges are to be replaced by larger and heavier structures to meet the requirements of the increasing traffic and increasing tonnage of rolling stock. A number of the present sidings will be extended and new additional sidings will be constructed. All 56 and 60 lb. rails will be taken up and replaced by 80 lb. rails. The deviation of the line and the putting in of a permanent structure in place of the present wooden trestle at Red Sucker Cove will be completed.

Western Division.—New standard housed-in water tanks on stone foundations will be erected at Bird's Hill, Margach, Hawk Lake, Vermilion Bay, Raleigh and Finmark. New stations will be erected at Rosenfeld, Reston and MacGregor. Five 55 ft. turntables will be replaced by 70 ft. turntables. Many improvements will be made at Fort William, including renewal of docks, alteration and extension of yards, construction of annexes to elevators B. & D., installation of a coal handling plant, erection of new flour sheds. The new bridge over the Red River at Winnipeg will be completed and the consequent change in the location of the line will necessitate a great deal of work. A great deal of ditching, fencing and widening of embankments will be carried out. A number of new section houses and combination section houses and telegraph offices will be erected. Many of the present sidings will be extended and new additional sidings will be constructed. A number of wooden bridges will be replaced by permanent structures.

Pacific Division.—A glass roof will be erected over the station platform at Vancouver to protect the public from rain, and wharves will be filled and extended to accommodate increased shipping; cost about \$70,000. Mission bridge across the Fraser river to have new steel swing on masonry pier and some other parts of bridge to be replaced at cost of about \$65,000. Twelve large bridges and trestles on main line to be replaced at cost of over \$100,000, besides smaller ones too numerous to mention. Four new sidings to be built. New trails to be built, also shelters, near Glacier, Field, and on Shuswap lake at cost of \$12,000. Machine shops at Vancouver and Revelstoke are to be much improved and a lot of new machines put in. About 50

Lubricating Oils

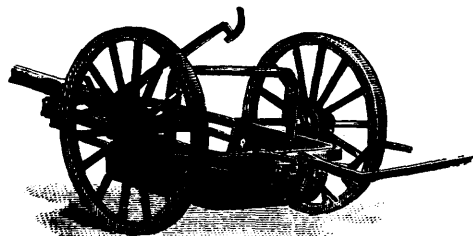
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miles of 80-lb. rails are to be laid in place of lighter ones now in track. On the Kootenay sections between Nelson and Robson, a dozen large trestles are to be filled at a cost of over \$90,000. The Columbia river bridge, near Robson, will be completed. Freight traffic is now carried over it, saving the cost and trouble of ferrying. The bridge over the Kootenay river, near Nelson, is to be replaced on an improved alignment by a masonry and steel viaduct. This will be completed across one channel of the stream this year at a cost of about \$60,000. For the increased ore traffic on the Columbia and Western branch, new locomotive houses, new sidings and new spurs are to be built.

Missisquoi River Bridge, Vt.—The new bridge spans being erected over the Missisquoi river, near Richford, Vt., consists of 2 deck lattice girder spans, each 100 ft. in length, on stone abutments. (April, pg. 139.)

Windsor Street Yard.—Nothing definite has been done in reference to the laying out of a large car yard, for which purpose press reports stated that land had been acquired. (April, pg. 139.)

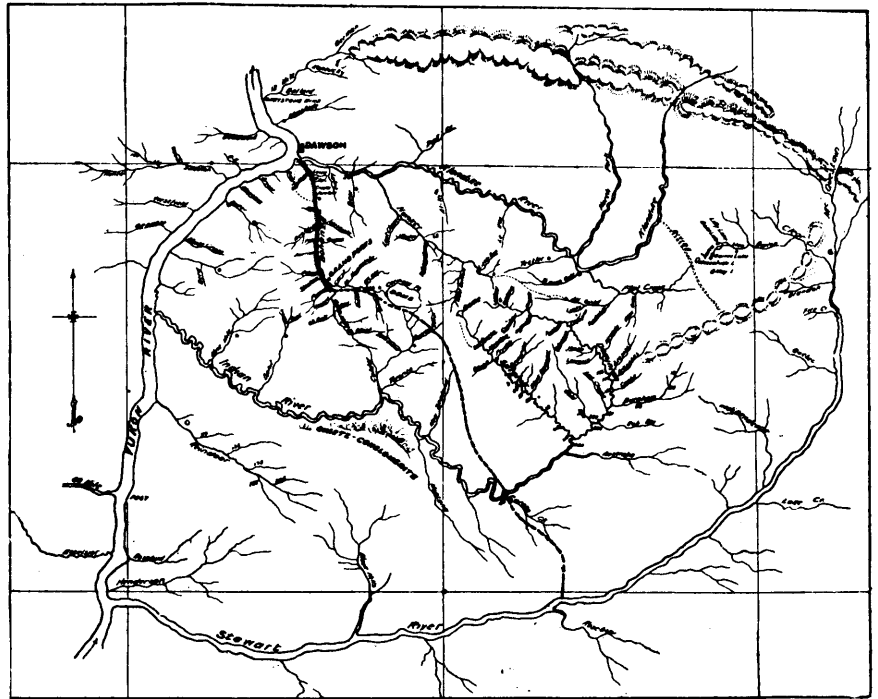
New Yard at St. Henri.—The Co. has acquired from the town council of St. Henri, a western suburb of Montreal, a block of land 525 by 275 ft., situated between St. John and Bourget streets, and the canal bank and St. Ambroise st.; and the council gave permission for tracks to be laid across Lacroix st. The site will be utilized as a freight yard, and it is said that a freight depot will be built on the canal wharf, and to utilize it the Co. will build a cross-over from its line in the vicinity of Lachine, to connect with the line which now runs from that neighborhood to St. John st., along the canal bank. This road, a little more than seven miles in length, was built several years ago by the G.T.R., and as the rails were laid on Government property the Crown exacted from the G.T.R. a clause in the agreement to the effect that the line would be open to all railway companies desiring to use it, upon payment of proper rental.

Montreal Shops.—The finance committee of the city council has recommended that the value of the land and proposed new shops at Hochelaga shall be fixed at \$400,000, and that taxes shall be paid on that amount for 20 years. The plans for the new shops have been completed and have been submitted to an engineer in the U.S. for an opinion before they are finally adopted. It has been decided that electricity shall be utilized as the motive power as well as for lighting the shops. (April, pg. 139.)

Piles Jet. to Grand Mere.—At the last session of the Dominion Parliament power was given the Co. to construct, within five years, a line from Piles Jct., on the North Shore Ry., or from the Piles branch, to Shawinigan Falls, and thence northeasterly to Grand Mere, about 22 miles.

The Northern Colonization Ry. Co.'s act of incorporation, authorizing the construction of a railway from Labelle, Que., via Nominique to Lake Temiskaming, Que., was revived at the recent session of the Dominion Parliament. The capital was reduced from \$1,000,000 to \$300,000, and the line is to be completed within five years. The charter has been acquired by the C.P.R., and surveys were made in 1901, for 25 miles from that Co.'s station at Labelle, to Nominique. It is expected construction will be gone on with during the present year. At the recent session of the Quebec Legislature the subsidy of \$5,000 a year for 12 years, was increased to \$8,000 a year for the same period. (April, pg. 143.)

Smith's Falls Spur.—The Railway Committee of the Privy Council has authorized the construction of a spur line along Hubert and Main streets, Smith's Falls, connecting the Co.'s tracks with the Frost & Wood Co.'s works, subject to restrictions as to speed.



ROUTE OF KLONDIKE MINES RY. FROM DAWSON TO STEWART RIVER (see pg. 193.)

Montreal-Toronto Line.—Press reports state that the improvements to be made during the current year between Smith's Falls and Toronto will cost \$1,000,000, and will include the reduction of grades, and the elimination of curves to such an extent that the haulage capacity of the locomotives will be largely increased. The sidings will be extended so as to hold an additional 10 cars, making their capacity 50 cars. Tenders for the clearing, grading, masonry, bridging and track-laying have been invited.

Brampton Station.—The proposed new station at Brampton, Ont., will be 24 by 65 ft. and will be of brick, built on a stone foundation. It will contain general and ladies' waiting rooms, ticket office, and lavatories. The platforms will be of concrete.

St. Thomas.—The C.P.R. has leased 380 Talbot st., St. Thomas, Ont., and is having it rearranged as a ticket, telegraph and express office. The new office will be opened early in July.

Port Arthur Station.—We were recently advised that nothing had been decided in connection with the proposed new station at Port Arthur.

Port Arthur Elevator.—The cleaning elevator of 500,000 bush. capacity which it was proposed to erect at Fort William, will not be built there, but at Port Arthur. It will be built of cement and will cost about \$150,000 (April, pg. 140.)

Fort William Elevators.—The working house and machinery at elevator D, were destroyed by fire on May 10, the damage being estimated at \$40,000. Wheat in two of the tanks, each containing about 100,000 bush., was damaged by the fire. The structure being erected of steel, was supposed to be fire-proof, but no building can be termed absolutely proof against fire which is allowed to contain highly inflammable refuse. The fire evidently originated among the piles of refuse from the cleaners which had been allowed to accumulate, and when once started the working tower of the elevator was like a huge chimney. The storage plant escaped injury, the wheat in the two tanks nearest the working house only being badly scorched, owing to the heat. It is considered that if

the tanks had been of concrete, or a less conductive material than steel the contents would have been practically undamaged.

Press reports state that contracts have been let for a 3,000,000 bush. elevator to be constructed of concrete; for a 2,500,000 bush. steel elevator, and for a 2,000,000 bush. addition to the original steel elevator at Fort William.

Fort William Shops, Etc.—Five stalls are to be added to the roundhouse, and \$75,000 is to be expended on the construction of repair shops.

Dinorwic to Lake Minnetakie.—Surveys have been completed for a line from Dinorwic, 197.5 miles west of Port Arthur, northerly to Lake Minnetakie, 14.51 miles, but nothing has been done in the way of surveys northerly to Lac Seul. The object of the line is to open up a good timber district, and it is also intended to continue the line on to Lac Seul, which would open up a big fishing district. It is expected that construction will be gone on with this year. The right of way is reported to have been cut. The Ontario Legislature, at its recent session, voted a subsidy for a line not exceeding 15 miles at \$3,000 a mile. (Feb., pg. 65.)

Hotel at Rat Portage.—The President, Sir T. G. Shaughnessy, replying recently to a deputation from Rat Portage, Ont., stated that he would visit that town shortly and discuss the advisability of the Co. building an hotel there. (Feb., pg. 65.)

Winnipeg Subway.—The Railway Committee of the Privy Council has issued an order expressing an opinion that the Co.'s application for approval of its plan and profile of its railway crossing with 6 additional tracks on Main st. should not be approved of, and directing that the Co. construct a subway 100 ft. wide, with a clear headway of 14 ft., the cost of which is to be defrayed as follows: Two-thirds by the C.P.R., and one-sixth each by the Winnipeg Street Ry. Co., and the City of Winnipeg. The subway is to be completed within 16 months. The Co.'s engineers are preparing plans for the subway for submission to the city and to the Department of Railways.

Winnipeg Station.—The question of the subway having been decided, the question of

the erection of a new station can be settled. W. Whyte, Assistant to the President, recently stated that the plans would not be prepared until the subway plans were approved of; the plans originally prepared would have to be altered and adapted to work in with the subway.

Winnipeg Bridge.—We are informed by an officer that the delay in construction has been on account of the difficulty in getting down with the foundation of the west shore pier, the work on Higgins st. subway, and the completion of the change of line, which could not be gone on with until the frost was out of the ground. The bridge is expected to be open by June 15. (Jan., pg. 7.)

Winnipeg Freight Offices.—New offices are being erected to replace those destroyed by fire, Mar. 21. The fire destroyed all the freight records for the past 22 years.

Government Aid to Manitoba Branches.—By the agreement entered into in June, 1901, between the Co. and the Manitoba Government the following branches were to be constructed in consideration of \$75,000 of subsidies: branch from Forrest to the municipality of Woodworth, tp. 11, range 24; about 42 miles extension of the Waskada branch, 18 miles; extension of the Snowflake branch, 9 miles; extension of the McGregor branch to the Brookdale settlement, about 10 miles. All of these lines are under contract and are expected to be completed this spring.

Winnipeg Beach Branch.—On May 7 tracklaying was reported to have been completed to within two miles of Winnipeg Beach. The summer resort there, on which the Co. has expended a considerable amount, will be opened this summer. (Jan., pg. 7.)

Osborne to Morden, Man.—It is reported that arrangements have been completed for the construction this year of the cut-off on the Pembina Mountain branch, between Osborne and Morden, about 40 miles. (Feb., pg. 65.)

Snowflake Branch.—Track is to be laid this season on the extension of 10 miles from Snowflake, southeasterly to Mowbray, graded last year. (Feb., pg. 65.)

Waskada Branch.—On the extension from Waskada, westerly to Lyleton, Man., which was graded last year, tracklaying is to be gone on with at once. It is not proposed to extend the branch beyond Lyleton, the Estevan branch serving the remainder of the district. (Feb., pg. 65.)

Carman to Boissevain.—It is not likely that any construction will be done on the proposed line between these points this year at

least, as the projected line between Glenboro and Lauder may be built instead. (Feb., pg. 65.)

Glenboro-Lauder Extension.—It is reported that construction will be gone on with at once on the branch from Glenboro to Lauder, Man., 67 miles, surveys for which were made last year. The branch will, it is said, be extended this year from Lauder westerly to the Provincial boundary, 24 miles. (Feb., pg. 65.)

The Manitoba and Northwestern Ry. Co., which two years ago was absorbed by the C.P.R., was at the recent session of the Dominion Parliament given an extension of time for five years within which it may complete its main line from its present terminus at Yorkton, Assa., to Prince Albert, Sask., and a branch from Russell, 167 miles from Portage la Prairie, to Assissippi. (Jan., pg. 3.)

Grading has been commenced on the first 30 miles of the extension northwesterly from Yorkton, Assa. J. D. McArthur is the contractor. (Feb., pg. 65.)

McGregor Branch.—Track is expected to be laid at once on the 10 miles from Wellwood to Brookdale graded last year. It is probable that the line will be extended 20 miles further to Forrest, on the old Great North-West Central Ry. (Feb., pg. 65.)

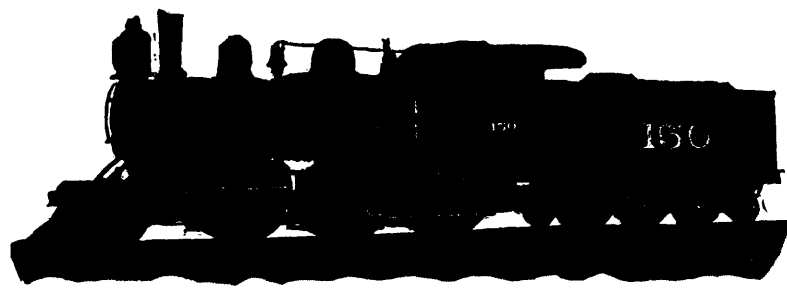
Branch from Forrest.—Last year 39 miles of grading was done on this branch, and 17 miles of track were laid from Forrest to Wheatlands. J. D. McArthur has the contract for completing the 3 miles of grading from the end of the 39 miles, into Lenore, which is expected to be completed this month. Track will be laid into Lenore this season. It is not intended that the branch shall be extended further, as the Assiniboine river would have to be crossed a few miles beyond Lenore. (Feb., pg. 65.)

Branch from Moosomin.—Construction is reported to have commenced on a branch from Moosomin, northwesterly in the direction of the Pheasant Hills. J. W. Stewart is said to have the contract for 100 miles of grading, and press reports state that a contract will be let for grading 200 miles further.

Main Line at Caron, Assa.—A press report states that surveys are being made for a change in the location of the main line from Caron, Assa., to a point about 65 miles westerly.

Banff Hotel.—A contract has been let for the erection of an addition to the hotel at this place, the work on which was commenced in May, and is expected to be completed for occupation next year. In order to guard against fire the addition will be built at a distance of 60 ft. from the present hotel, but will be connected with it by a one storey corridor. The new building will be 180 ft. 4 in. long, by 44 ft., about two-thirds being five storeys high, and the remainder four storeys, and will be in line with the present building. It will contain 94 bedrooms, 38 of which will be provided with bathrooms adjoining; and lavatories, etc., will be provided on each floor. Steam heating will be introduced, and in the center of the building will be an hydraulic combination passenger and freight elevator. The present boiler house is to be removed and a new one erected, in which two additional boilers will be installed. The dining-room in the existing building will be enlarged to enable 42 additional seats to be provided, and a new engine room is to be added in which an additional engine will be installed, so as to give power for laundry and electric light in the building. Hutchison & Wood, Montreal, are the architects, and J. A. Tompkins, Brockville, has the contract. The new building is expected to cost \$100,000.

<h2>Railway Supplies</h2> <hr/> <h1>HIRAM PIPER</h1> <p>12 ST. PETER STREET</p> <hr/> <h2>MONTREAL</h2> <hr/> <p>PATENTEE AND MANUFACTURER OF THE</p> <h3>Hiram Piper Two Direction Train Order Signal</h3> <p>Patented Canada, Great Britain, United States</p>	<p>Switch Lamps Ship Lamps Street Lamps Lamp Burners Lamp Chimneys Lamp Wick</p>
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Hotel at Emerald Lake.—A small hotel has been constructed, and was expected to be open for tourists June 1, at Emerald Lake, 6 miles from Field, B.C. The building is constructed on the lines of a Swiss chalet, and is so located that it can be extended some 50 ft. in the rear, and an addition of 50 ft. built to the dining-room. The building is 52 ft. 8 in. by 28 ft., having an extension of 33 ft. by 12 ft. in the rear, two storeys high. On the ground floor there is a dining-room 31 ft. by 26 ft., in the rear of which is the kitchen, storeroom and servants' quarters, the office and 3 bedrooms, while on the first floor are 11 bedrooms, two being 15 ft. by 10 ft. each. Lavatories and bathrooms are provided on each floor. The main walls are of hewn timber 10 ins. square, and the interior is finished in hardwood. In the dining-room a feature is the large open boulder or brick fireplace. There is a verandah 7 ft. deep in front of the hotel on the ground floor, and a balcony round three sides of the hotel at the first story, with stairs reaching the ground. The plans were prepared in the Co.'s office at Montreal.

Improvements at Field.—Some \$40,000 or \$50,000 will, it is said, be spent at Field during the year in improving the station buildings, and in laying out pavilions and other places for the entertainment of tourists.

Field-Ottertail Deviation.—The proposed deviation is about 7 miles in length, starting from about one mile west of Field station and running westward to Ottertail siding. The change will cut out grades both east and west-bound of 2.2%, and substitute a continuous grade of 1.2% against eastbound traffic for the entire seven miles. (Dec., 1901, pg. 361.)

The Palliser Grade.—Surveys were made two years ago with a view to the reduction of the grades near Palliser, B.C., but we were recently advised that nothing had been decided as to when the work would be commenced. It is in contemplation to make a survey for the improvement or completion of the tunnel there.

Robson Bridge.—H. F. Forrest, Dominion Inspector of Railways at Winnipeg, has inspected the new bridge over the Columbia river. Passenger trains were operated over the bridge April 21, and freight trains had been run over it for some weeks previously. The bridge is 720 ft. in length, with a swinging span of 120 ft. The approaches consist of a fill for a depth of 35 ft. and a distance of 1,000 ft. on the east side and a cut of 2,000 ft. through a 30-foot gravel bank on the west side. The piers are 10 ft. wide and 20 ft. long, with cut-water fronts. They are eight in number, the highest being 80 ft. in height, from where it rests on pile foundations. At low water the pier is in 35 ft. of water, and when the river rises to its highest point in the summer the pier will be in 70 ft. of water, allowing for a rise of 35 ft. They are built of granite quarried near Nelson. The structure cost \$175,000, which is \$25,000 more than the original estimate. (Feb., pg. 65.)

Revelstoke Shops.—An addition of 60 ft. is being built to the blacksmiths' shop. It is contemplated to instal an electric plant for power and lighting purposes in the yards, station and hotel.

Branch from Spence's Bridge.—Surveys were made two years ago for a line from Spence's Bridge to Midway, B.C., the terminus of the Columbia and Western Ry., and plans for a line connecting the two points have been filed. No decision, however, has been arrived at as to construction.

Vancouver Terminals.—Considerable work has been done towards the construction of additional dock accommodation for the Co. It is intended to extend the Co.'s docks down to Stimson's wharf, running out from Abbott st.

Vancouver to New Westminster.—The Dominion Parliament at its last session autho-

rized an extension of time for five years within which the line authorized in 1900 from New Westminster to Vancouver, B.C., may be constructed.

Vancouver and Lulu Island Ry.—The bridge across False Creek has been completed and the spans for the bridge across the north arm of the Fraser river have been framed. The bridge was expected to be completed by May 1. The grade at False Creek had to be raised 4 feet to conform to the new levels. The grading has been completed to within a mile of Steveston. (Feb., pg. 25.)

Nelson Shops.—The machinery for the new shops at Nelson, B.C., has arrived, and a new car repairing shed is projected. The increasing traffic in the district has crowded the existing facilities at the yards to such an extent that the enlargements were made necessary.

Castlegar Station.—The new station to be built at Castlegar, B.C., will be a handsome structure of brick, on a stone foundation. The main building will be 50 ft. 10 in. by 32 ft. 2 in., and will contain, on the ground floor, general and ladies' waiting rooms, ticket office and baggage room, while on the 2nd storey there will be seven bedrooms and a bathroom. In an extension at the rear, 35 x 25 ft., will be provided a restaurant and dining room. (Feb., pg. 65.)

Arrowhead and Kootenay Ry.—It was recently reported that the bridges had been built from the track end at Tenderfoot creek, some 23 miles from Lardo, to Gerrard, hitherto known as Selkirk and Twin Falls, 10 miles, and that the grading was finished with the exception of a mile of filling near the lake, and two miles of filling near Tenderfoot creek. The track was expected to be laid early in June. (Feb., pg. 65.)

SUBSIDIARY LINES.

Duluth, South Shore and Atlantic Ry.—It is reported that a branch line is to be constructed from Allensville to Rudyard, Mich.

Minneapolis, St. Paul and Sault Ste. Marie.—It is reported that the line from Sault Ste. Marie, Mich., to Gladstone, 153 miles, is to be relaid this season with 80 lb. rails; that 125 miles will be ballasted with gravel; and that five wooden span bridges are to be replaced with plate girder bridges on concrete abutments.

Press reports state that a branch line is to be constructed from Braddock to Bismark, N.D., and that the work will be completed this year. An officer states that the Co. will not extend its lines in South Dakota this year; press reports stated that a branch line to Aberdeen, S.D., was in contemplation.

London (Eng.) Offices.—Plans have been received at Montreal of the new office building proposed to be erected on the recently acquired site in Trafalgar square. The plans provide for a six-story building, 115 ft. in height, with a tower at one side. The front will show a combination of marble and granite. It is understood that construction will be gone on with as early as possible. The plans were originally prepared by Bruce Price, of New York, and were sent to London for the details to be worked out.

The town of Whitby, Ont., a number of years ago voted a subsidy to the Whitby, Port Perry and Lindsay Ry. Co., under the terms of which the Co.'s shops were located in Whitby. The Co. was afterwards absorbed by the G.T.R., and the shops were pulled down. Suit was brought to recover damages and the Ontario Court of Appeal has decided that pulling down the buildings was a removal of the same, and the G.T.R. must pay damages therefor, the amount of which has been left to the Local Master to assess.

Grand Trunk Ry. Betterments, Etc.

Portland, Me.. Elevator.—The new elevator is reported completed. The Co. has now elevator accommodation at this point for 3,000,000 bush. (Mar., pg. 103.)

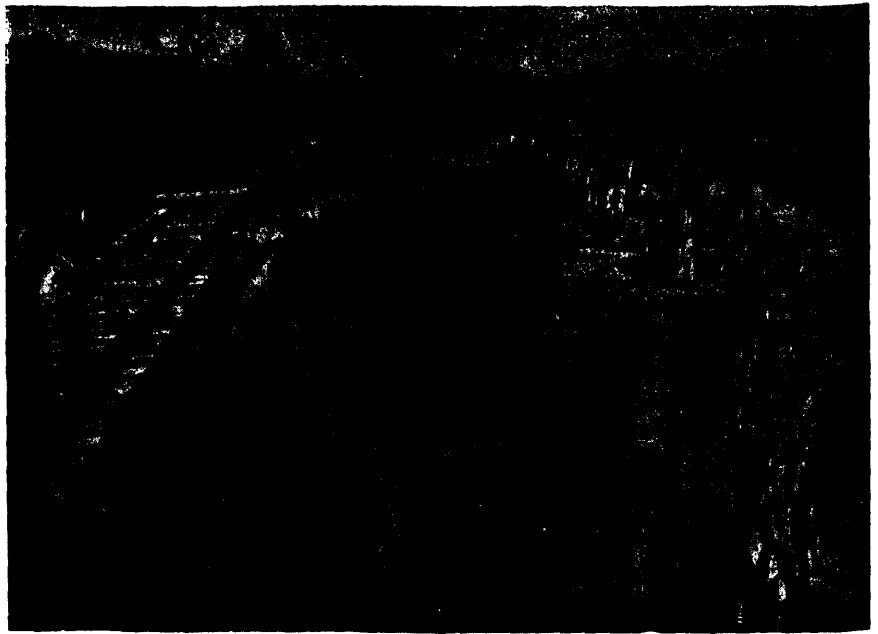
Gorham Shops.—We are officially informed that there was no foundation for the recent press reports that it was the intention of the Co. to close the shops at Gorham, N.H.

The Montreal General Offices have been completed and will be occupied in the first week of June. The building is constructed of Bedford, Indiana, limestone, resting on a base of Quebec granite. The polished pillars, which are a feature of the front, are also of Quebec granite. The vestibule is one of the handsomest entrances to a public building on the continent and is composed of four kinds of rare marble; the lower portion of the vestibule being of black and gold marble from Italy and green marble from Greece; the rose tint marble is from France, and the large panels were brought from the south side of the Pyrenees in Spain. The three panels between the doors at the head of the steps are of a very rare species of marble from Nubia. They are composed of variegated colors of bright hues and are a most interesting study, while the panels on the sides are beautifully marked. Objects of animals and other subjects can readily be discerned in the markings of the marble. The faience of the vestibule is composed of tile work from Gloucester, Eng., and is a magnificent piece of work, being glazed porcelain embellished with embossed designs which give the appearance of Italian majolica. The tout-ensemble is a work of great beauty. On entering the corridor of the first floor the first thing which strikes the eye is the beautifully designed elevator shafts constructed of wrought iron work of chaste design with filigree pattern and large monogram "G.T.R." in the centre. The corridor is lined with Belgian marble in large slabs 8 ft. high which perfectly match at the joints and present beautiful designs in variegated shades. This marble is used throughout the building for wainscoting, and figures such as a lion's head, donkey's head, jack rabbit's head, tiger heads, frogs, snakes and many other objects are discernible in the markings. The elevators are of a high speed hydraulic pattern. The electric switch board which is located in the engine room is attached to two large panels of marble, which it is said are the finest in this country. Another modern innovation which has been adopted are ventilating fans, which will be found a great boon in the summer as these fans when working will distribute cool air throughout the building; and in the spring and fall they can be utilized to distribute hot air when necessary to take the chill from the atmosphere on raw days when the steam heating would not be necessary. The boiler house is detached from the main building and is located in the rear. There is hot and cold water throughout the building. The electric fixtures are of a specially chaste design. Ceiling lights are provided for each office, the private offices having suspended fixtures, and one light is provided for each clerk. Modern lavatories are located on each floor. The modern mechanical appliances for heating, ventilating, etc., and the large boilers for the steam heating apparatus are also located on this floor. The system of steam heating that has been installed is of the most modern pattern, working automatically, and instead of the steam being forced through the pipes, it is drawn through by suction, the pipes being cleared of water automatically by the pumps, thus creating a vacuum and drawing the steam through. The stairways leading from floor to floor are made of Tennessee marble, while stair rails and railings around the wells in the centre of each floor are of beautifully designed wrought iron. The floors

of each flat are of vitrified tile work. The large vaults that are located in the several departments are spacious and fully equal to all requirements. The light conditions and ventilation of the building are considered the best in Canada and equal to any in the world. The ceilings are high, the windows are large and there is not a dark corner in the whole building. The woodwork throughout is quartered oak, with the exception of the Second Vice-President and General Manager's office, which is finished in mahogany. At the foot of the main stairway leading from the first floor have been placed two griffins which are symbolical of strength and swiftness, strength being represented by the body and legs of a lion, and swiftness by the wings and beak of an eagle, in addition to a pair of listening ears, which are symbolical of watchfulness. The Dominion Bridge Co. were the contractors for the iron work used in the construction of the building.

The various departments have been located throughout the building so as to best suit business relations one with the other. On the ground floor are the offices of the Canadian, American and National Express Companies, and the book bindery in connection with the audit department, as well as floor space for storage and a well-equipped and modern mail room, fitted up with all the facilities to handle the heavy mail that is daily received and distributed in an institution like the G.T.R. On the first floor are the general audit department, Paymaster's office and financial and money order departments of the Canadian Express Co. The offices that are located on the second floor are the Treasurer, Cashier, Division Freight Agent and Freight Claim Agent. The third floor is called "the Executive Floor," the following offices being located on it: Second Vice-President and General Manager, Assistant to Second Vice-President, land office; Third Vice-President, General Assistant and Comptroller, Claims Agent, Freight Traffic Manager, general freight department; Passenger Traffic Manager, passenger department and advertising department. On the fourth floor are located the following offices: Manager, Chief Engineer and drawing office, car accounting, car service, telegraph and telephone exchange. The telegraph office is equipped with all the latest improvements and modern appliances that are known, and the telephone exchange is also arranged with latest improvements and will be in charge of two operators. On this floor, in connection with the Chief Engineer's office, is a blue print room with all the accessories necessary to expedite the work of this department. On the fifth floor are the following offices: General purchasing department, legal department, medical department, Insurance and Provident Society and the general offices of the Canadian Express Co. In the south tower of the building two rooms have been provided to be used as an observatory, from which a splendid view of the St. Lawrence river, the harbor and the city can be had. The large clock in the centre of the middle tower was made in England. In connection with it is a striking bell, weighing in the neighborhood of 2,000 lbs., placed on the top of the roof, and which can be heard from a great distance. (Mar., pg. 103.)

Bonaventure Station Improvements.—The improvements in hand and in contemplation at Bonaventure station, Montreal, have led the level crossing committee of the city council to again consider the question of compelling the elevation of the tracks. Several meetings of the committee have been held, but no decision has been reached. It is understood



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STEAMERS

CHICORA, CHIPPEWA, CORONA

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— CONNECTIONS —

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At Queenston with Niagara Falls Park & River R.R.

At Niagara-on-the-Lake with Michigan Central R.R.

Five Trips Daily (except Sunday). First Trip for 1902, May 14th.

JOHN FOY, General Manager, Toronto, Ont.

JAMES PLAYFAIR, Pres. & Gen'l Mgr.

D. L. WHITE, Vice-President.

J. W. BENSON, Sec'y-Treas.

MIDLAND TOWING & WRECKING CO., LTD., MIDLAND, ONT., CANADA

First-Class Tugs for Wrecking, Raft Towing, Etc. Steam Pumps, Divers, Jacks, Hawsers and Lighters

that the Co. at one time offered to expend \$1,000,000 on this work if the city would pay the balance.

Bonaventure Freight Sheds.—A permit has been issued by the Montreal city council for the erection of the new freight sheds at Bonaventure station. The buildings will be two stories high, and will be of pressed brick and stone. The offices will front on Chaboillez square.

Montreal Sidings.—The Railway Committee of the Privy Council has approved of the construction of a siding from the G.T.R. tracks across St. Etienne st., to the Laing abattoir.

Montreal Elevators.—The Co.'s proposition to the Harbor Commissioners to construct an elevator at Windmill Point, has been laid before the Public Works Department. The Co. proposes, with the approval of the authorities, to expend \$1,200,000 on elevator and other terminal facilities. (Jan., pg. 8.)

Montreal Guard Pier.—The Montreal Harbor Commissioners have decided to lay 2½ miles of track on the guard pier at a cost of \$25,000, and to lease to the G.T.R. the use of the same at \$7,000 a year. It is understood that any other railway company can obtain the use of these tracks on paying a proportionate share of the \$7,000. The G.T.R. is the only company that has applied for the use of the tracks, and it is consequently called upon to pay the whole of the charge.

Entrance to Ottawa.—Press reports recently stated that the G.T.R. was negotiating for the purchase of the Ottawa and New York Ry. from Cornwall to Ottawa, but General Manager Hays stated the reports were without any foundation. Another report stated that the Co. would construct a line from Brockville, or would lease such a line into Ottawa, as soon as it was constructed.

Brockville Sidings.—It is proposed to double the siding accommodation at the Mahitoba yards, Brockville, Ont. The sidings now accommodate 250 cars.

Montreal-Toronto Second Track.—Work has been commenced on the double-tracking between Port Hope and Whitby, 33.13 miles, the only portion of single track now remaining between Montreal and Toronto. On this section there will be 12½ miles of deviation from the present main line for the purpose of securing better alignment and easier gradients. The Railway Committee of the Privy Council has approved of the changes. One deviation will be immediately west of Port Hope, and will be 7 miles in length, re-joining the present main line near Newtonville; and the second will commence at Bowmanville and extend to mile-post 295½, near Darlington, a distance of 5½ miles. The curvature on the new line will be very much less than upon the existing one, and the gradients will be easier, particularly for eastbound traffic, which is heavier than the westbound. The work will be prosecuted with the utmost despatch. P. Breen & Co., St. Catharines, Ont., are the contractors. (Mar., pg. 103.)

Collingwood Sidings.—A siding has been constructed from the Co.'s tracks into the steel works, in course of erection, and to the quarries from whence the stone is being taken.

Owen Sound Extension.—The Board of Trade has voted against any further extensions of railways southward along the streets and public property, and has asked the town council to refuse the recent application of the G.T.R. to extend its tracks on Stephen st. (Mar., pg. 103.)

Bridges at Hamilton.—The question of the bridge at Strachan st., Hamilton, has again been before the city council. Manager McGuigan met the committee and reiterated the proposition made by the Co. last year, for a tee bridge at Wellington and Ferrie streets,

with a footwalk over the tracks at Strachan st. and the closing of the street for roadway purposes. This was the only scheme, in his opinion, that the railway would consider. The tee bridge scheme would mean an expenditure for the city in approaches of something over \$12,000.

The bridge at Burlington Heights is reported completed. During the construction of the new steel bridge over the canal at Burlington, passenger and freight traffic between Hamilton and Burlington, via the Beach, has been suspended, the service being operated via Waterdown and Burlington Jct. (Mar., pg. 103.)

Hamilton-Niagara Falls Double-tracking.—Grading for the double-tracking on the remaining portion of the line between Hamilton and Niagara Falls, 43.51 miles, was commenced at Jordan April 17, and the work is to be completed by Oct. 1. The section under contract is from Jordan to St. David, 14.42 miles, the 26.46 miles from Hamilton to Jordan, and the 2.63 miles from St. David to Niagara Falls being already double-tracked. The earthwork on the section now under construction will be heavy, averaging about 25,000 cubic yards a mile. John Ross, Montreal, is the contractor for the grading, and the Co. will do the ballasting and tracklaying. The following bridges will be erected on the section:—double-track viaduct over 20-mile creek at Jordan to consist of 8 deck spans of 115 ft. each, resting on 7 towers, with 7 intermediate spans of 35 ft. each; total length of viaduct 1,170 ft., height 62 ft. Double track bridge over 12-mile creek east of St. Catharines, to consist of 3 spans of 100 ft. each, one span 65½ ft., and 2 steel towers 25 ft. each; length over all 416 ft., height 80 ft. Double track swing bridge across old Welland canal at Merriton, 119 ft. long. Single track skew bridge 250 ft. in length at a very acute angle, carrying Welland railway over G.T.R. main line. Double track swing bridge across new Welland canal east of Merriton, 176 ft. long. Double track bridge over the Michigan Central Rd., at a very acute angle, 60 ft. long. The contractor for the masonry is W. Gibson, Beamsville, Ont. (Dec., 1901, pg. 362.)

Main Line Deviation to Brantford.—The by-law voting \$57,000 to secure the deviation of the main line through Brantford, Ont., was passed by the ratepayers April 17. The location of the deviation has been approved by the Railway Committee of the Privy Council. About 7 miles of line will have to be constructed under the agreement. The by-law requires the approval of the Ontario Legislature before it is binding. (Mar., pg. 103.)

Stratford Freight Sheds.—New freight sheds are to be constructed, and the tracks in the yard are to be rearranged.

Stratford Shops.—It is reported that an addition of 40 ft. is about to be made to the length of the main shop, which already covers 3½ acres; the smaller shops are to be enlarged, and a new boiler shop erected.

Bridges on Southern Division.—The bridges on the Southern division are all to be reconstructed, a contract for that purpose having been let to the Dominion Bridge Co., Montreal. Work will be commenced on the bridge over Kettle creek.

Windsor River Front.—The Co.'s solicitor has written the Windsor city council that the Co. will give the city a 10 years' lease of the G.T.R. property on the river front between Church st. and Bruce ave., at \$5 a year and taxes, and to continue to lease the same from year to year thereafter subject to termination on one year's notice.

Point Edward and Sarnia Docks.—It is reported that considerable improvements are to be effected at the ferry docks at Point Edward and Sarnia.

June Birthdays.

Many happy returns of the day to Harry Abbott, President Vancouver and Lulu Island Ry., ex-General Superintendent C.P.R., at Vancouver, B.C., born at Abbotsford, Que., June 14, 1829.

F. F. Backus, General Freight and Passenger Agent, Toronto, Hamilton and Buffalo Ry., at Hamilton, Ont., born at Rochester, N.Y., June 4, 1860.

Archer Baker, European Traffic Manager C.P.R., at London, Eng., born at York, Eng., June 21, 1845.

Edgar Berryman, C.E., Montreal, Assistant Engineer, Lake Superior Division, C.P.R., born at Queenston, Ont., June 27, 1839.

F. P. Brady, Superintendent, C.P.R., at Toronto, Ont., born at Haverhill, N.H., June 22, 1853.

T. Crockett, ex-General Manager, Temiscouata Ry., at Riviere du Loup, Que., born at Passekeg, N.B., June 18, 1854.

W. H. D'Arcy, Claims Agent, C.P.R., at Winnipeg, Man., born at Manorhamilton, Leitrim, Ireland, June 23, 1859.

W. F. Fitch, Vice-President and General Manager, Duluth, South Shore and Atlantic Ry.; President and General Manager Mineral Range Rd., at Marquette, Mich., born at Circleville, Ohio, June 28, 1839.

G. W. Hibbard, General Passenger Agent, Duluth, South Shore and Atlantic Ry. and Mineral Range Road, at Marquette, Mich., born at St. John's, Que., June 15, 1852.

L. R. Johnson, Assistant Superintendent of Rolling Stock, C.P.R., at Montreal, born at Abingdon, Berks., Eng., June 22, 1855.

W. D. Matthews, Director C.P.R., Toronto, born at Burford, Ont., June 22, 1850.

A. C. Lytle, Granby, Que., ex-Superintendent and General Freight Agent, Orford Mountain Ry., born at Hemmingford, Que., June 6, 1854.

C. E. McPherson, General Passenger Agent, C.P.R., at Winnipeg, Man., born at Chatham, Ont., June 7, 1861.

W. R. MacInnes, Assistant Freight Traffic Manager, C.P.R., at Winnipeg, born at Hamilton, Ont., June 7, 1867.

F. Price, Master of Transportation, G.T.R., at London, Ont., born at Montreal, June 11, 1864.

Marcus Smith, C.E., Ottawa, Ont., Consulting Engineer, formerly Assistant Chief Engineer of Government Railway, born at Berwick-on-Tweed, Eng., June 10, 1815.

F. L. Somerville, Resident Engineer, G.T.R., Middle Division, at Toronto, born June 1, 1855.

H. B. Spencer, Superintendent C.P.R., at Ottawa, Ont., born at Oxford, Ont., June 6, 1856.

C. F. Stevens, President Central Ry. of New Brunswick, at Hampton, N.B., born at Geneva, Ontario County, N.Y., June 21, 1850.

A. J. Taylor, Canadian Freight and Passenger Agent, Chicago, Milwaukee and St. Paul Ry., at Toronto, born at Ottawa, Ont., June 24, 1857.

J. H. Teall, General Manager Tilsonburg, Lake Erie and Pacific Ry., at Tilsonburg, Ont., born at Vienna, Ont., June 24, 1847.

W. W. Walker, General Freight Agent, Duluth, South Shore and Atlantic Ry. at Duluth, Minn., born at St. Catharines, Ont., June 3, 1868.

T. Williams, Treasurer and Chief Accountant, I.C.R., at Moncton, N.B., born at Handsworth, Warwickshire, England, June 3, 1846.

The cars on the Reid Newfoundland Co.'s St. John's street railway were put in operation in April, after having been out of service during the winter.

Railway Equipment Notes.

The C.P.R. Co. has placed an order for building 500 box cars of 60,000 lbs. capacity at its Hochelaga shops.

The Minneapolis, St. Paul and Sault Ste. Marie Ry. added to its equipment during April, 4 locomotives and 200 flat cars, 40,000 lbs.

The Quebec Ry., Light and Power Co. reports its equipment to be : 3 locomotives, 21 flat cars, 5 box cars, 23 passenger cars and 10 electric cars.

The Intercolonial Ry. has received from the American Locomotive Co.'s Scranton works the last of the 6-wheel passenger locomotives ordered.

The G.T.R. has placed an order to build in its own shops 1,000 box cars, 60,000 lbs. capacity, and with the other dimensions the same as the last lot built.

The C.P.R.'s 10-wheel passenger locomotive, an illustration of which appears on page 207, is one of a number recently built at the Co.'s Montreal shops, where others are being built. The general dimensions were given in our May issue, pg. 170.

The Algoma Central and Hudson's Bay Ry. Co.'s equipment consists of 18 locomotives, 6 passenger, 3 combination and 1 official cars; 100 flat cars, 40,000 lbs.; 50 flat cars, 50,000 lbs.; 4 flat cars, 60,000 lbs.; 100 flat cars, 80,000 lbs.; 20 box cars, 50,000 lbs.; 200 ore cars, 100,000 lbs.; 137 dump cars, 1 tool car, 3 snow plows, 2 flangers, 4 steam shovels, 12 cabooses and 14 boarding cars.

The Quebec Southern and South Shore railway has added 5 passenger coaches to its equipment. The total number of cars is reported to be 110, but no details are given showing how it is made up, except that there are 17 passenger coaches. The combined rolling stock of the Quebec Southern Ry. and the South Shore Ry. in Jan., 1902, was 12 locomotives, 10 box cars, 59 freight cars, 5 miscellaneous and 12 passenger coaches.

The Lake Erie and Detroit River Ry. Co.'s equipment now consists of 27 locomotives; 22 1st class passenger cars, 19 2nd class passenger cars, 2 combination cars, and 7 baggage and mail cars, with freight cars as follows : 3 cabooses, 44 box cars, 40,000 lbs.;



BARRETT TRACK JACK

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Adopted by all the Leading Railroads in the United States and Canada

Catalogue on application.

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THE DUFF MAN'G CO.
Pittsburg, Pa., U.S.A.

Stock carried by
JAMES COOPER, Agent,
MONTREAL.



THE BEAVER POST-HOLE DIGGER

STEEL BLADES, STEEL FORGED JAWS AND GAS PIPE HANDLES.

Workmanship and Material the best obtainable, regardless of price.

Digs a hole any size, slant or shape, and in any soil.

Will sink a hole close beside a wall; removes an old post, making room for a new one with one digging; cuts roots of any reasonable size, and will lift out stones like a pair of tongs.

With the Beaver Digger a hole may be dug in less time and with less effort than with any machine that has been produced up to the present time.

Consignments of Beaver Diggers, (repeat orders) have been shipped to the four leading Railways of Canada within the last thirty days.

HALL & SON
(Formerly of Port Perry)
50 BAY ST., TORONTO, ONT.

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The Flexibility of Manilla
Strength of Wire and the
Wearing Qualities of Both

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HIGHLY RECOMMENDED FOR :

Pile Driving
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WIRES AND CABLES

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THE WIRE AND CABLE COMPANY, - - - MONTREAL.

RAILWAY APPOINTMENTS, ETC.

Canadian Northern Ry.—J. Gunn, Superintendent of the Toronto Ry., and H. E. H. Vernon, Transfer Clerk of the Toronto Ry. Co., have retired from the directorate of the C.N.R., and have been succeeded by W. Mackenzie and D. D. Mann. The other directors are:—F. Nicholls, Z. A. Lash, K.C., and J. M. Smith, Controller of the Toronto Ry., who is also Secretary-Treasurer of the C.N.R. W. Mackenzie has been elected President, and D.D. Mann Vice-President. The other officers are:—General Superintendent, D. B. Hanna, Winnipeg; Traffic Manager, G. H. Shaw, Winnipeg; Auditor, C. E. Friend, Winnipeg; Land Commissioner, T. A. Burrows, Winnipeg. The principal agents are:—W. Phillips, General Eastern Agent, Toronto; R. H. Bell, Travelling Freight and Passenger Agent, Montreal; P. H. Attwood, City Ticket Agent, Winnipeg; W. K. Mercer, Agent, Port Arthur, Ont.

Canadian Pacific Ry.—E. H. McHenry has been appointed Chief Engineer. Office at Montreal.

Dr. E. W. Spragge has been appointed Chief Medical Officer, and Dr. H. A. Beatty

Chief Engineer and General Manager, succeeding J. W. Daly, resigned.

Dominion Coal Co.—The position of Assistant to the 2nd Vice-President and General Manager has been abolished and A. Dick, who held it, has been appointed General Sales Agent.

Duluth, South Shore and Atlantic Ry. and Mineral Range Rd.—The car records of these companies, heretofore kept in the Auditor's department, have been transferred to the General Superintendent at Marquette, Mich.

Grand Trunk Ry.—Garret Vliet, Assistant Master Mechanic, has been transferred from Gorham, N.H., to Portland, Me., but will continue in charge of the Gorham station in addition to his supervision of the mechanical matters at Portland.

S. B. Kramer, formerly Chief Dispatcher of the Central Vermont Ry., has been appointed Chief Dispatcher of the G.T.R.

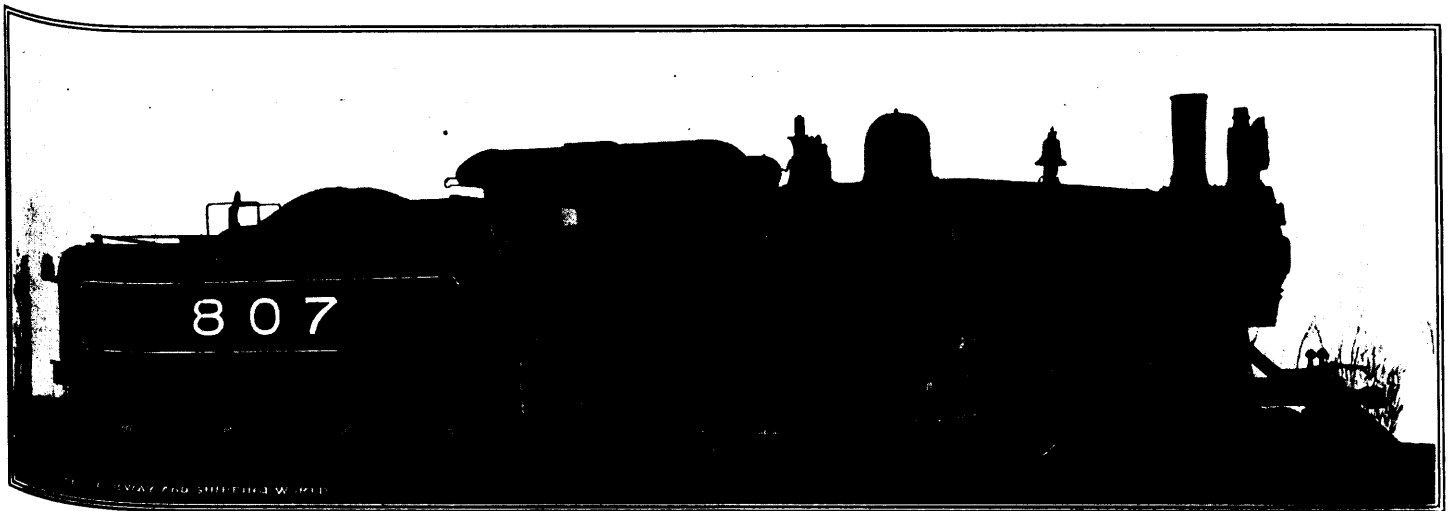
N. B. Edwards has been appointed Chief Clerk to the Master Mechanic at Montreal, succeeding F. S. McNamara appointed storekeeper of the Denver and Rio Grande Rd.

H. E. Whittenberger and C. H. Bevington, having resigned to accept service with other

175 flat cars, 40,000 lbs.; 6 flat cars, 60,000 lbs.; 15 flat cars, 50,000 lbs.; 15 gondola coal cars, 50,000 lbs.; 14 gondola coal cars, 60,000 lbs.; 39 gondola coal cars, 40,000 lbs.; 2 auxiliary cars. Ten gondola cars are operated on the line by the Ontario Steam Navigation Co. Since Jan. 7 additional first-class passenger cars have been added and the following changes made in the freight equipment: 40 of the 40,000 lb. flat cars and 11 of the 40,000 lb. gondola cars and one caboose have been taken out of service, and the 15 of the 50,000 lb. flat cars and 14 of the 60,000 lb. flat cars have been converted into gondola coal cars of the same capacity.

The G.T.R., as mentioned in our last issue, is building 5-simple 10-wheel locomotives and 35 compound moguls at its Montreal shops for delivery during this year. Following are fuller dimensions than we gave last month:—

Type	Simple	Compound
Number ordered	5	35
Weight on drivers	132,608	149,744
Total weight	177,772	163,704
Stroke of pistons	26 in.	26 in.
Diameter of cylinders	20 in.	22½ in. and 35 in.
Diameter of drivers	73 in.	63 in.
Type of boiler	Extended wagon top	
Working steam pressure	200	200
Heating surface—total	2460 sq. ft.	1991
Tubes, number	283	283



CANADIAN PACIFIC RAILWAY TEN-WHEEL PASSENGER LOCOMOTIVE.

Tubes, material	Charcoal iron.
outside diameter	2 in.
length	15 ft. 0 in. | 11 ft. 11 in.
Firebox, length	120 in.
width / inside	40½ in.
material	Steel.
Grate area	33.43 sq. ft.
Tank capacity for water	6,000 U.S. gallons.
Coal capacity	20,000 lbs.

The C.P.R. in April ordered 20 10-wheel compound freight locomotives to be built at the American Locomotive Co.'s Schenectady works, for delivery during the latter part of the year. Following are the general dimensions:

Weight on drivers	122,000 lbs.
truck	37,500 lbs.
total	159,500 lbs.
Wheel base, driving	14 ft. 10 in.
total, engine	25 ft. 11 in.
Cylinders, diameter and stroke	22 and 35 in. x 26 in.
Driving wheels, diameter	62 in.
centers diameter	55 in.
material	cast wheel
journals	9 in. x 12 in.
Engine truck wheels	30 in.
journals	6 in. x 10 in.
extended wagon top radial stay	62½ in.
Boiler, type	210 lbs.
diameter O. D. 1st ring	108 in. x 41 in.
pressure	312. 2 in.
Firebox, length x width	No. 11 B.W.G.
Tubes, number of and diameter	14 ft. 0 in.
thickness	10 in. steel channels
length	33 in.
Tender frame	center bearing
wheel, diameter	52 in. x 10 in.
truck, type	U shape, gravity
journals	5,000 imp. gals.
Tank, type	
water capacity	

Chief Surgeon of the Ontario division. Offices at Toronto.

G. J. Bury, heretofore Assistant General Superintendent, has been appointed General Superintendent of the Lake Superior Division. Office at North Bay.

A. Black has been appointed Roadmaster of the Algoma Branch, with office at Webbwood, vice S. J. Faught, transferred. His jurisdiction extends from west Soo branch switch Sudbury to east end of International Bridge, Sault Ste. Marie.

W. Comrie has been appointed Roadmaster of Chapleau section with office at Chapleau; vice A. Black transferred. His jurisdiction extends from east switch Cartier yard to east switch Chapleau yard.

S. J. Faught has been appointed Roadmaster of White River section with office at Chapleau, vice W. Comrie transferred. His jurisdiction extends from east switch Chapleau yard to east switch White River yard.

A. Allan, heretofore Chief Dispatcher at Calgary, Alta., has been appointed acting Superintendent at Moose Jaw, Alta., relieving W. Milestone, who is on leave of absence.

W. M. Godsoe, chief operator of the Co.'s Halifax telegraph office, has been appointed Manager there, succeeding W. J. Morrisette, transferred to Montreal.

Cape Breton Ry.—R. W. Leonard, heretofore Chief Engineer, has been appointed

companies, [W. E. Costello has been appointed Assistant Superintendent of the 15th, 16th, 17th, 18th, 19th and 20th districts, in charge of all matters pertaining to transportation and stations. Office London, Ont. F. Price has been appointed Master of Transportation, vice C. H. Bevington. Office, London, Ont.

The position of Trainmaster of the 15th, 16th, 17th, 18th, 19th and 20th districts has been abolished.

The jurisdiction of Trainmaster P. J. Lynch has been extended over the 21st district, vice W. E. Costello promoted. Office, Stratford, Ont.

L. G. Coleman has been appointed Assistant to the Superintendent of the northern division at Allandale, Ont., with supervision over matters pertaining to transportation and such other duties as may be assigned to him.

W. G. Bartlett has been appointed Resident Engineer of the western division at Detroit, Mich., vice Chas. J. Crowley, resigned.

E. L. Crull has been appointed Travelling Freight Agent at Battle Creek, Mich., to succeed W. H. Spicer, appointed chief rate clerk in the freight office at Chicago.

C. B. Chapman, chief freight tariff clerk in the freight department at Chicago, has been appointed chief clerk of that department, vice H. C. Martin.

The following agents have been installed: Lockes Mills, Me., F. E. Purrington; St. An-

nes, Que., D. A. McKeever; Summerstown, Ont., G. Beriault; Napanee, Ont., F. W. Roberts; Mariposa, Ont., D. H. Murray; Burks Falls, Ont., T. H. Tebo; Lisle, Ont., G. Simpson; Shakespeare, Ont., J. J. Maguire; Hamilton, King st., Ont., A. E. Hayward; Tilsonburg, L.L., Ont., M. J. Field; Simcoe, L.L. and G.B., Ont., J. A. McDonald; Harriston, Ont., R. J. Martin; Wingham, Ont., G. A. Stokes; Blythe, Ont., C. W. Vail; Goodells, Mich., G. E. Payne; Burt, Mich., R. M. Matheson; Penn, Mich., G. C. Wilson; Casopolis, Mich., C. D. Major; Drayton Plains, Mich., W. G. Peterhans; Spring Lake, Mich., George Rankin; Ferrysburg, Mich., C. Langland; Owosso, Mich., C. G. Robinson; Coopersville, Mich., M. K. Plummer; Gooding, Mich., R. S. Kistler; Muskegon, Mich., J. N. Anderson.

Great Northern Ry., U.S.A.—C. Wuttele has been appointed general agent at Vancouver, B.C., vice F. J. Wheeler, resigned. He is succeeded as general agent at Victoria, B.C., by K. J. Burns, and G. I. Sweeney has been appointed general agent at Tacoma, Wash., in place of Mr. Burns.

Hamilton Steamboat Co.—M. Leggat has been elected President, vice M. A. Kerr, deceased. W. E. Bishop has been appointed General Manager.

Intercolonial Ry.—V. Z. Caracristi, of Richmond, Va., is reported to have been appointed chief draftsman of the mechanical department at Moncton, N.B., vice Mr. Vogel, resigned.

Kettle Valley Lines.—T. E. Birbeck, General Freight and Passenger Agent, and W. C. Haywood, Auditor, recently left their headquarters at Grand Forks, B.C., and the following announcement was made by Assistant General Manager Morris: "A complete audit shows a shortage of \$5,884 in the accounts of Birbeck and Haywood. They misappropriated refunds made by the C.P.R. and other roads on account of excess of freight charges for material and equipment brought in for our road. Their official positions gave them exceptional facilities for speculating. Over \$1,000,000 have passed through the hands of General Manager Holland and myself, and the Co. and its officers feel that the shortage discovered is a small affair, considering the large amount disbursed and the number of men that hold responsible positions of trust. The complete audit exculpates every official except the abiding officials. We are taking steps to secure their apprehension."

Lackawanna-Grand Trunk Line.—The office of the Manager, W. P. Fitzsimons, has

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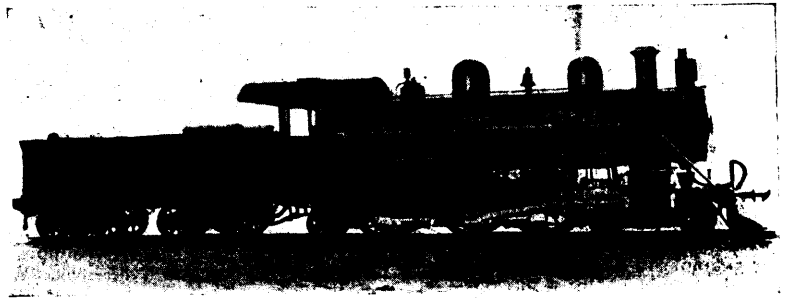
We delight in giving information.

W. F. CLONEY, Trav. Pass. Agent, Niagara Falls, N.Y.
H. FOSTER CHAFFEE, Western Pass. Agent, Toronto, Ont.

JOS. F. DOLAN, City Ticket Agent, Montreal, Que.
THOS. HENRY, Traffic Manager, Montreal, Que.

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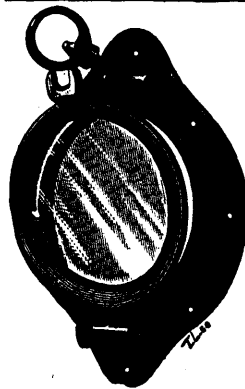


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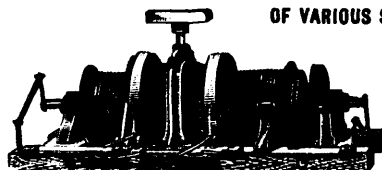
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been removed from Buffalo, N.Y., to Brother Jonathan Building, Chicago, Ill.

Michigan Central Rd.—F. Nichol is reported to have been appointed Trainmaster at St. Thomas, Ont.

Minneapolis, St. Paul and Sault Ste. Marie Ry.—C. T. Eckels, Superintendent at Enderlin, N.D., is reported to have resigned.

New York and Ottawa Ry.—H. K. Gays, Assistant General Passenger Agent, having resigned, the position has been abolished. Mr. Gays has been appointed representative of the Weare Commission Co. at St. Louis, Mo.

New York Central Rd.—L. Drago, Canadian Passenger Agent, whose headquarters heretofore have nominally been in Toronto, but who has resided in Niagara Falls, Ont., has removed to Toronto and will probably have an office in the city.

H. J. Hebert has been appointed city ticket agent at Montreal.

Ottawa, Northern and Western Ry.—Pontiac Pacific Jct. Ry.—These lines having passed under the control of the C.P.R., A. R. Creelman, Chief Solicitor of the C.P.R., has been elected President, and C. W. Spencer, General Superintendent of the Eastern Division, C.P.R., Vice-President and General Manager. P. W. Resseman continues as General Superintendent; H. B. Sims has been appointed Assistant Engineer, succeeding G. C. Dunn, Chief Engineer, who has associated himself with H. J. Beemer in contracting work.

Quebec Southern Ry.—G. W. Bartlett having resigned the position of General Superintendent, to become Resident Engineer of the G.T.R. at Detroit, Mich., E. C. Lalonde has been appointed Superintendent of the Shore Line division (St. Lambert to St. Francois, inclusive), with office at Sorel, Que., and R. A. Trudeau, Superintendent of the Southern division (St. Robert Jct. to Noyan Jct., inclusive), with office at St. Hyacinthe, Que.

F. D. Anthony has been appointed Chief Engineer in charge of maintenance of way, construction, bridges and buildings, with office at Sorel, Que., vice E. Lantier, resigned.

All accounting matters heretofore handled by E. C. Lalonde, have been transferred to M. M. Thomson, Auditor, Montreal.

Rutland Rd.—Dr. W. Seward Webb has been elected President, succeeding P. W. Clement, resigned.

F. H. Button has been elected Clerk and Secretary to the Board and Corporation, succeeding H. G. Smith, resigned.

C. H. Bevington, heretofore Master of Transportation of the G.T.R. at London, Ont., has been appointed Superintendent of the Rutland Rd. at Rutland, Vt.

J. W. Smith, heretofore secretary to the General Manager, and acting Purchasing Agent of the Canada Atlantic Ry., has received an appointment on the Rutland Rd., and will do its purchasing.

J. M. Ferris has been appointed Travelling Passenger Agent. Office at Burlington, Vt.

H. J. Jagoe, formerly Western Travelling Passenger Agent for the West Shore Rd., has been appointed District Passenger Agent of the Rutland Rd. Office at New York.

Victoria Terminal Ry.—James Anderson has succeeded Capt. S. F. Mackenzie as Manager. Capt. Mackenzie is reported to have sold his interest in the line to E. V. Bodwell, K.C., probably representing the Great Northern Ry., U.S.A.

Mainly About People.

John Cassils, President of the Dominion Express Co., died suddenly in Montreal, May 21.

John Ryan, contractor, who died in Toronto a short time ago, left an estate valued at \$236,995.

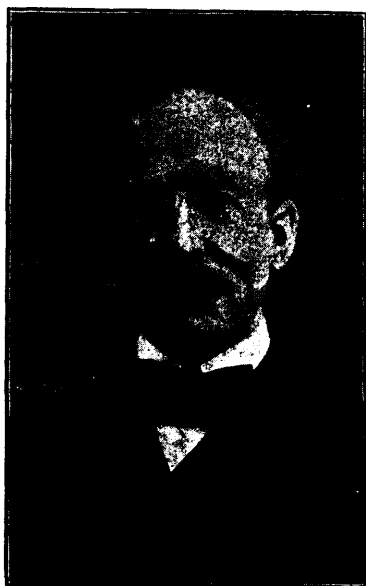
F. H. Clergue, according to press reports, is going to build a handsome residence at Sault Ste. Marie, Ont.

Mrs. W. R. Baker, wife of the Assistant to the Second Vice-President of the C.P.R., died in Montreal May 30, after a brief illness.

The family of C. M. Hays, 2nd Vice-President and General Manager, G.T.R., have arrived in Montreal to resume their residence there.

M. C. Dickson, formerly District Passenger Agent of the G.T.R., at Toronto, has been appointed special agent of the Federal Life Assurance Co.

At the recent annual meeting of the Southern Pacific Co. the only change in the board was that W. B. Cornish was elected a director, vice C. M. Hays.



J. D. McDONALD,

Recently appointed District Passenger Agent of the G.T.R. at Toronto.

E. A. Chapman, formerly C.P.R. yardmaster at Rat Portage, Ont., and latterly engaged in newspaper work, died in Rat Portage, recently.

G. F. Gibson, heretofore accountant of the Montreal Terminal Ry. Co., has been appointed Secretary of the Pacific Coast Lumber Co., at Vancouver, B.C.

S. A. Jones, heretofore travelling freight agent of the G.T.R. at Buffalo, N.Y., has gone to the Delaware, Lackawanna & Western Rd. in a similar position.

Dr. E. E. Kitchener was elected Vice-President for Canada of the International Association of Railway Surgeons at the recent annual meeting at St. Louis, Mo.

Jas. Scott, President of the Northern Navigation Co. of Ontario, who died in Toronto recently, left an estate in Canada valued at \$109,064, and in the U.S. valued at \$182,414.

R. H. Bell, who recently resigned from the G.T.R. service at Toronto, to take the position of Travelling Passenger and Freight Agent for the Canadian Northern Ry. at Montreal, was presented with a silver tea service by his former associates.

Joseph Coniain, who was in the employ of the old Great Western Ry. in 1854, and was latterly stationmaster at the G.T.R. King st. station, Hamilton, Ont., died there, May 13, aged 80.

D. L. Curtice, formerly of the engineering department of the Canada Southern Ry. and later Chief Engineer of the St. Paul & Pacific Rd., died at his home in Saint Paul, Minn., recently, aged 74.

Captain A. Cameron, of the mail steamer Northumberland, running between Summerside and Shediac, has been appointed an examiner of masters and mates in the coasting trade at Charlottetown, P.E.I.

C. J. Crowley, who recently resigned his position as Resident Engineer of the western division of the G.T.R. at Detroit, Mich., has entered the service of the Delaware, Lackawanna and Western Rd.

H. E. Whittenberger, who recently resigned the position of Trainmaster of the G.T.R. at London, Ont., has been appointed Superintendent of the division of the Denver and Rio Grande Rd., at Alamosa, Colo.

A. R. Creelman, Chief Solicitor of the C.P.R., is giving up his house in Toronto with the intention of taking up his residence in Montreal in the autumn. Mrs. Creelman and family leave for Europe in July.

H. Darling, who recently resigned his position as Manager of the British Yukon Navigation Co., at Whitehorse, Yukon, has opened an office in Vancouver as marine surveyor, consulting engineer, ship broker, and general commission and shipping agent.

W. Duperow on leaving the G.T.R. service to assume the position of General Manager and Secretary-Treasurer of the Huntsville and Lake of Bays and Lake Simcoe Navigation Co. (Ltd.) was presented with a travelling bag by the staff of the District Passenger Agents' office, Toronto, where he had been chief clerk.

Harry A. Norton, of Coaticook, Que., who has just returned from an extensive trip through Mexico and Cuba, will sail for Europe on July 2, to visit the various European agencies of the Norton ball-bearing jacks. The Coaticook plant has orders for extensive shipments of these jacks for Australia, Norway and South America.

F. Grundy, General Manager of the Quebec Central Ry., has gone to England. Press reports say it is for the purpose of consulting the directors regarding an offer which has been made for the purchase of the road by New Englanders. It is said a powerful organization is being formed in Boston, with a view of merging all the New England roads, and that the Quebec Central is wanted in order to afford a Quebec connection.

F. Price, who has been appointed Master of Transportation, G.T.R., at London, Ont., was born in Montreal, June 11, 1864, and entered railway service, 1879, as a telegraph messenger, G.T.R., and held various positions until 1896, since which his record has been: 1896 to 1899, stenographer to F. H. McGuigan; 1899 to July, 1901, chief clerk in Car Service Agent's office; July, 1901, to May, 1902, chief clerk to F. H. McGuigan.

F. Walker, who has been appointed chief C.P.R. train dispatcher at North Bay, Ont., was born in Pontiac, Ill., Feb. 8, 1867, and entered railway service in 1883 as operator, and served in that capacity on several lines until 1885, when he was appointed operator in the general offices of the Oregon Ry. and Navigation Co. at Portland, Ore., since which his record has been: 1888 to 1891, train dispatcher at Portland, same Co.; 1891 to 1893, chief train dispatcher, Union Pacific Rd., at Butte, Mont.; was in private business for some years from 1893, but subsequently joined

The President and Secretary-Treasurer of the Canadian Roadmasters' Association have issued a circular stating that a meeting of the Association will be held at Hamilton, Ont., on Oct. 15.

the C.P.R. operating staff at Winnipeg, Man., and acted as relieving dispatcher on the Western division, being appointed dispatcher at Fort William, Ont., 1900, and later on Trainmaster at Rat Portage, Ont.; 1901 to April, 1902, Chief Train Dispatcher and Trainmaster at Cranbrook, B.C.

John Halstead, who has been appointed Travelling Freight Agent for the C.P.R. at Winnipeg, was born in Bracebridge, Ont., Mar. 2, 1877, and entered railway service Jan., 1892, since which he has been consecutively to 1894, clerk, C.P.R. freight office, London, Ont.; 1894 to 1897, clerk C.P.R. local freight offices, Toronto; 1897 to 1901, clerk and stenographer, General Freight office, C.P.R., Toronto; July, 1901, to Mar. 31, 1902, chief clerk to General Freight Agent, Western Division, C.P.R., at Winnipeg.

John Pullen, General Freight Agent of the G.T.R., whose portrait appears on the first page of this issue, was born at Shepton Mallett, Somersetshire, Eng., Jan. 23, 1863, and entered railway service as office boy in office of the Assistant - General Freight Agent G.T.R., at Sherbrooke, Que., in 1877, since which he has been consecutively, 1878 to 1881, clerk and stenographer General Freight Agent's office, same road at Montreal; 1881 to 1889, secretary to Traffic Manager, Chicago and Grand Trunk Ry., at Chicago; 1889 to 1896, agent West Shore Fast Freight Line and Reading Despatch, at Chicago; April, 1896, to Aug., 1897, Division Freight Agent G.T.R., at Stratford, Ont.; Aug., 1897, to May, 1899, Division Freight Agent, same road, at Hamilton, Ont.; May, 1899, to May, 1900, General Freight Agent Central Vermont Ry., at St. Albans, Vt.; May, 1900, to date, General Freight Agent G.T.R., at Montreal. He is President of the Canadian Freight Association.

C.P.R. Earnings, Expenses, Etc.

Gross earnings, working expenses, net profits and increases or decreases over 1900-01, from July 1, 1901 :-

	Earnings.	Expenses.	Net Profits.	Increase or Decrease
July	\$2,851,455.31	\$1,755,588.37	\$1,095,866.94	\$211,493.04 +
Aug.	3,118,551.32	1,812,919.23	1,305,632.09	251,156.49 +
Sept.	3,264,024.16	1,911,292.44	1,352,731.72	292,031.71 +
Oct.	3,582,403.05	2,115,363.83	1,467,039.22	388,864.81 +
Nov.	3,583,383.47	2,142,505.33	1,440,878.14	375,329.82 +
Dec.	3,497,733.70	1,929,042.19	1,568,691.51	130,325.90 +
Jan.	2,621,791.71	1,801,330.91	820,460.80	172,264.35 +
Feb.	2,349,039.34	1,674,678.66	674,360.68	53,680.84 +
Mar.	2,953,769.50	1,868,854.54	1,084,914.96	106,579.23 +
Apr.	3,263,848.79	1,972,142.16	1,291,706.33	110,897.82 +
	\$31,086,000.35	\$19,013,717.66	\$12,072,282.69	\$2,094,624.01 +

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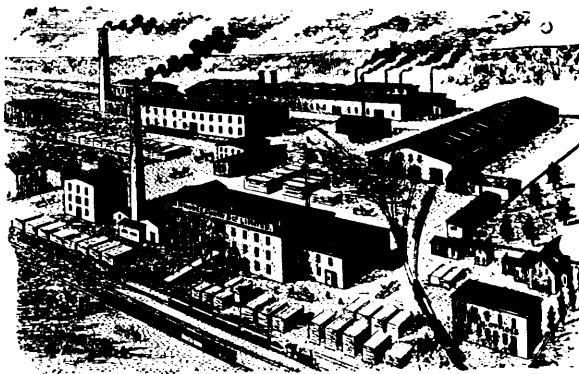
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SUBSIDIARY LINES.

DULUTH, SOUTH SHORE AND ATLANTIC RY.—Gross earnings for Mar., 1902, \$201,020.79; net earnings, \$71,023.17; against \$204,746.77 gross and \$75,834.11 net for Mar., 1901. Net earnings for nine months ended Mar. 30, 1902, \$711,415.24, against \$619,137.76 for same period last year. Approximate earnings for April, \$241,797, against \$203,567 in April, 1901.

MINERAL RANGE RY.—Approximate earnings for April, 1902, \$61,852, against \$44,949, for April, 1901.

MINNEAPOLIS, ST. PAUL AND SAULT STE. MARIE RY.—Gross earnings for Mar., \$450,346.88; net earnings, \$207,733.85; against \$364,105.77 gross and \$164,690.69 net, for Mar., 1901. Net earnings for nine months ended Mar. 30, 1902, \$2,511,086.75, against \$1,379,880.51 for same period 1901. Approximate earnings for April, \$469,293, against \$409,613, for April, 1901.

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from Jan. 1 to April 30 :

	1902.	1901.	In-crease.	De-crease.
Grand Trunk....	£1,524,800	£1,487,897	£36,903	.....
G. T. Western....	309,294	296,704	12,590	.....
D. G. H. & M....	71,219	64,456	6,763	.....
Total.....	£1,905,313	£1,849,057	£56,256	.....

Per Diem Charges for Freight Cars.

Most of the time of the spring meeting of the American Railway Association at New York, April 23 and 24, was occupied in discussing the report of the car service committee on a code of per diem rules to govern settlements for the use of freight cars. A few slight amendments were accepted by the committee and the rules were adopted by a vote of 72 lines against 11.

A code of per diem rules were recommended for adoption and each rule treated in detail. Relative thereto the report of the committee is quoted as follows :

"The committee asks that the code of per diem rules shall be discussed, rule by rule, and when finally agreed upon it recommends that the following resolution be passed by a vote by roads: Resolved, That the code of per diem rules be adopted by this Association.

"It also recommends the passage of the following resolution: Resolved, That the secretary of the Association obtain from the railroad companies of the United States, Canada and Mexico their signatures to an agreement to pay for the use of freight cars of other railroad companies upon the per diem basis under the rules of the American Railway Association, such agreement to be in the following general terms :

"The subscribing railroad companies agree with each other to abide by the rules governing settlement for the use of freight cars as adopted by the American Railway Association, for one year from July 1, 1902, and to continue to abide by said rules thereafter, subject to revocation on three months' notice to the Secretary of the Association.

"Provided, That this agreement shall go into effect only after it has been signed by a majority of the membership of the American Railway Association, and further that such membership shall represent two-thirds of the cars owned or controlled by members of the Association.

"Although the rules presented are the best the committee has been able to make, it presents them, fully believing that no code of rules can be a finality. The committee desires the help of the Association in improving these rules, and thanks the Association for the opportunity it has had of leading the way, if only for a space, in one of the great railroad movements tending toward efficiency, economy and honesty."

The following definitions were recommended :

Home Car—A car on the road to which it belongs.

Foreign Car—A car on a road to which it does not belong.

Private Car—A car having other than railroad ownership.

Home—A location where a car is in the hands of its owner.

Home Road—The road which owns a car, or upon which the home of a private car is located.

Home Route—The line of intermediate roads over which a foreign car was moved from home.

Home Junction—A junction with the home road.

Home Route Junction—A junction on the home route.

Switching Service—The movement of a car at a fixed charge for the service rendered, the road performing such service not participating in the freight rate.

Per diem rules governing settlement for the use of freight cars submitted are as follows:

The rate for the use of freight cars shall be 20 cents a day, which shall be paid for every calendar day, and shall be known as the per diem rate. Days shall be reckoned by subtracting the date of receipt from the date of delivery. A road which receives and delivers a car on the same day shall not pay the per diem for that day.

A road shall have the right to demand the return of its car after it has been out 20 days consecutively on any road. If the car is held by that road more than 10 days after the date of such notice, making 30 days in all, thereafter a penalty rate of 80 cents a day in addition to the per diem rate shall be paid by such road for the further use of that car.

All railroads, including ferry lines, shall be responsible to the car owner for amounts accruing for the use of a car at the established rates, whether such car is in road service or switching service, until the car has been delivered to the owner or to another road.

An arbitrary amount for each car in switching service may be reclaimed by the switching line from the road for which the service was performed. This amount shall be based upon the average number of days actually required, and determined by the roads directly interested for each local territory.

In case a road delivers an empty car without the consent of the owner to a road which does not pay per diem, or if a road permits the loading or reconsigning of a foreign car without the consent of the owner to such a road, it shall be responsible for the payment of an amount equal to the per diem accruing on the car while on such road.

When a car has been destroyed or so damaged as to require an appraisal under the master car builders' rules, the per diem charge will cease from the date of notice to owner.

When a car is detained awaiting the receipt of repair material from its owner, the per diem charge will cease from the date the necessary material is ordered from the owner until the date when it is received by the road holding the car.

The interchange reports shall close at midnight, and shall include all cars exchanged upon the date named unless otherwise noted thereon. The reports must be sent to the car record office on each day, whether cars are exchanged or not. In cases where there are different standards of time at junction points, the earlier time shall be used. The interchange reports to the car record office from junction points must be signed by the agents or other authorized representatives of both roads on the prescribed form, the receipt of cars delivered being thereby acknowledged.

The junction report for each day will be made to car owners on the prescribed form as promptly as possible after the receipt of the interchange report for that day.

Within 30 days after the end of each calendar month car owners shall be furnished with a per diem report for that month, on the prescribed form, showing the number of days each car has been in service upon the road making the report. In computing per diem, the day of receipt should be disregarded and payment made for the day of delivery.

The settlement of amounts accruing for the use of cars shall be made monthly without regard to reclaims pending.

When reclaims are made for allowances on account of special conditions they must be made by the designated transportation officer of the road which pays the per diem, to the designated transportation officer of the road from which the allowance is reclaimed.

When a road refuses or fails to promptly receive from a connection cars upon which it has laid no embargo, it shall be responsible to the connection for the per diem on cars so held for delivery, including the per diem on

Canadian Pacific Railway Land Sales.

	Acres.		Amount.	
	1900-01	1901-02	1900-01	1901-02
July.....	40,715.46	49,089.96	\$129,483.42	\$154,646.84
Aug.....	32,178.50	50,747.82	103,480.78	165,871.16
Sept....	21,807.57	60,060.46	69,012.54	197,057.61
Oct.....	18,858.89	150,572.06	62,769.54	465,655.62
Nov.....	22,408.68	151,922.89	69,677.27	512,862.94
Dec.....	27,388.15	132,151.16	83,528.59	403,261.78
Jan.....	29,928.80	109,846.99	86,752.54	347,761.91
Feb.....	29,370.22	78,039.43	91,189.58	256,156.70
Mar.....	39,346.14	101,029.22	122,362.47	333,852.22
April....	48,874.13	231,127.11	152,445.70	695,071.68
	368,985.54	1,034,400.00	\$1,047,296.55	\$3,532,198.46

Grand Trunk Ry. Earnings, Expenses, &c

The following statement of earnings, supplied from the Montreal office, includes the G. T. of Canada, the G. T. Western, & the Detroit, Grand Haven & Milwaukee Rys.

	1902.	1901.	Increase.	Decrease.
Jan.....	\$2,278,978	\$2,242,117	\$36,861	.....
Feb.....	2,018,926	2,005,341	13,585	.....
Mar.....	2,537,873	2,386,099	151,773	.....
April....	2,436,756	2,365,491	71,265	.....
	\$9,272,533	\$8,999,039	\$273,494	.....

The following figures are issued from the London, Eng., office :

GRAND TRUNK RY.

Revenue statement for Mar. :

	1902.	1901.	Increase.	Decrease.
Gross receipts....	£425,100	£385,600	£39,500	.....
Working expenses	261,000	263,700	.....	2,700
Net profit.....	£164,100	£121,900	£42,200	.....

Aggregate Jan. 1 to Mar. 31, 1902 :

	1902.	1901.	Increase.	Decrease.
Gross receipts....	£1,128,200	£1,097,100	£31,100	.....
Working expenses	761,000	772,500	.....	£11,500
Net profit.....	£376,200	£324,600	£42,600	.....

GRAND TRUNK WESTERN RY.

Revenue statement for Mar. :

	1902.	1901.	Increase.	Decrease.
Gross receipts....	£78,500	£87,500	.....	£9,000
Working expenses	64,000	71,600	.....	7,600
Net profit.....	£14,500	£15,900	.....	£1,400

Aggregate Jan. 1 to Mar. 31, 1902 :

	1902.	1901.	Increase.	Decrease.
Gross receipts....	£221,900	£217,200	£4,700	.....
Working expenses	189,100	185,600	3,500	.....
Net profit.....	£32,800	£31,600	£1,200	.....

DETROIT, GRAND HAVEN AND MILWAUKEE, RY.

Revenue statement for Mar. :

	1902.	1901.	Increase.	Decrease.
Gross receipts....	£17,800	£17,100	£700	.....
Working expenses	12,600	13,200	.....	600
Net profit.....	£5,200	£3,900	£1,300	.....

Aggregate Jan. 1 to Mar. 31, 1902 :

	1902.	1901.	Increase.	Decrease.
Gross receipts....	£54,100	£48,600	£5,500	.....
Working expenses	37,900	37,800	100	.....
Net profit.....	£16,200	£10,800	£5,400	.....

the home cars of such connection. If such refusal or failure to receive shall continue for more than three days, the delinquent line shall thereafter in addition be responsible for the per diem on all cars in transit which are thus held back for delivery. It shall be the duty of a connection intending to reclaim such per diem allowance to notify the delinquent line daily of the total number of cars so held for it.

When a road gives notice to a connection that for any reason it cannot accept cars in any specified traffic, thereby instituting an embargo, it should receive cars already loaded with such traffic at the time such notice is

issued. If it does not receive such cars the road holding them may reclaim per diem from the road placing the embargo for the number of days such cars are held, not exceeding the duration of the embargo. After the date of the notice a road must not load or reconsign cars in such traffic to the road issuing the notice. All such notices must be given by telegraph, by the embargoing road to its immediate connection, and by it transmitted as may be necessary.

These rules shall not apply to private cars. To interpret these rules and to settle disputes arising under them an arbitration com-

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Lands in Alberta and Saskatchewan with the exception of some special locations where prices range from \$3.50 to \$5.00 per acre, generally \$3.00 per acre.

TERMS OF PAYMENT.

In the case of an actual settler who goes into residence upon and cultivates the land, the aggregate amount of purchase money and interest is divided into ten instalments, as shown in the table below; the first to be paid at the time of purchase, the second two years from date of purchase, and the remainder annually thereafter.

- 160 acres at \$3.00 per acre, 1st instalment \$71.90, and nine equal instalments of \$60.
- 160 acres at \$3.50 per acre, 1st instalment \$83.90, and nine equal instalments of \$70.
- 160 acres at \$4.00 per acre, 1st instalment \$95.85, and nine equal instalments of \$80.
- 160 acres at \$4.50 per acre, 1st instalment \$107.85, and nine equal instalments of \$90.
- 160 acres at \$5.00 per acre, 1st instalment \$119.85, and nine equal instalments of \$100.
- 160 acres at \$5.50 per acre, 1st instalment \$131.80, and nine equal instalments of \$110.
- 160 acres at \$6.00 per acre, 1st instalment \$143.80, and nine equal instalments of \$120.

Purchasers who do not undertake to go into residence on the land within one year from date of purchase are required to pay one-sixth of the purchase money down and the balance in five equal annual instalments with interest at the rate of six per cent. per annum.

DISCOUNT FOR CASH. If land is paid for in full at time of purchase, a reduction from price will be allowed equal to ten per cent. of the amount paid in excess of the usual cash instalment.

Interest at six per cent. will be charged on overdue instalments.

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Burlington Elevator, St. Louis, Mo.	1,300,000	Bushels
Grand Trunk Elevators, No. 1 and No. 3, Portland, Me.	2,500,000	"
Export Elevator, Buffalo, N.Y.	1,000,000	"
J. R. Booth Elevator, Depot Harbor, Ontario	1,000,000	"
Cleveland Elevator Company's Elevator, Cleveland, O.	500,000	"
Erie R. R. Transfer & Clipping House, Chicago, Ill.	100 cars in 10 hrs.	"
Manchester Ship Canal Co.'s Elevator, Manchester, Eng.	1,500,000	"
Burlington Elevator Co., Peoria, Ill.	500,000	"
Canada Atlantic Railway Elevator, Coteau Landing, Que.	500,000	"
Northern Grain Co., Manitowoc, Wis.	1,350,000	"
Union Elevator, East St. Louis, Ill.	1,100,000	"
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mittee of five members shall be appointed by the committee on car service. Three members of the arbitration committee shall be a quorum.

In case any question or dispute arises under these rules between members of the Association it may be submitted to the arbitration committee through the Secretary of the Association in abstract. The abstracts shall briefly set forth the points at issue and each party's interpretation of the rules upon which its claim is based. The arbitration committee shall base its decision upon the rules and the abstract submitted, and its decision shall be final. Should one of the parties refuse to furnish the necessary information the arbitration committee shall use its judgment as to whether it can properly decide. All decisions shall be reported to the Association through the committee on car service.

In case a question shall arise not covered by the rules, the roads disagreeing may by mutual consent submit such questions to the arbitration committee.

The committee on car service may appoint a secretary for the arbitration committee, who shall be paid by the Association. The other expenses of the arbitration committee shall be divided equally between each of the parties to the dispute and the Association. The expenses shall be first paid by the Association and then billed to the parties concerned by the treasurer of the Association.

The following question was put to the railroads by means of a circular:

"Are you disposed to favor changing the present mileage basis of settlement for car service to a per diem basis, provided a practical per diem system can be devised?"

Replies received from 133 roads, with 155 memberships, operating 152,653 miles of road and owning and controlling 1,257,031 freight cars. This is 64.3% of the total membership and 77% of the mileage operated. One hundred and eleven members, owning and controlling 1,085,824 freight cars and operating 128,557 miles of road, are in favor of per diem. Fifteen members, owning and controlling 87,464 freight cars and operating 12,949 miles of road, are not in favor of per diem. Twenty-nine members, owning and controlling 83,743 freight cars and operating 11,147 miles of road, express no opinion.

COMPARISON OF REPLIES.

On basis of membership replying:	
Favors per diem	71.6%
Opposed to per diem	9.7%
Express no opinion	18.7%
On basis of cars owned by roads replying:	
Favor per diem	86.3%
Opposed to per diem	6.9%
Express no opinion	6.8%
On basis of miles operated by roads replying:	
Favor per diem	84.2%
Opposed to per diem	8.5%
Express no opinion	7.3%

Standard Dimensions of Box Cars.

At the spring meeting of the American Railway Association held April 23 and 24 in New York, the following report of a committee was adopted:—

In accordance with the resolution adopted by the Association, Oct. 23, 1901, the Master Car Builders' Association has been requested to consider the required external dimensions for the standard box car, based upon the interior dimensions, as prescribed by the Association.

Your committee has been informed that a committee of the M.C.B. Association has decided upon such outside dimensions, and that they have been submitted by them to the different railroads. It is understood by your

committee that the dimensions suggested are acceptable to the railroads, and that at the June session of the M.C.B. Association, they will, no doubt, be adopted.

A question has been raised as to the necessity of the adoption of a door opening of 6 ft. in width. It seems advisable that the Association should be informed as to the reasons which actuated the committee in recommending and the Association in adopting that width. In this connection the committee desires to state that in considering a standard box car it was thought best to increase the width of the side door opening to 6 ft. for convenience in loading. The adoption of a standard car would naturally prohibit the building of more furniture cars, and it was found on investigation that, in order to facilitate the handling of a large number of bulky articles, for which furniture cars are now provided, it would be a convenience, and in some cases an actual necessity, to increase the width of the car door opening to at least 6 ft. The standard box car takes the place of the present box and furniture cars of different sizes, and as soon as these cars become obsolete by deterioration or otherwise, to enable all classes of commodities to be taken care of by the standard car it will be necessary that the car be made to suit all which are provided for in the classification as near as it is possible to do so. It seems, if the present construction of the frame of the car is not sufficiently strong to admit of such an opening, its strength should be increased.

It will be a source of gratification to the Association to learn that at South Bend, Ind., where a large percentage of shipments of light and bulky articles originates, and where the number of cars over 36 ft. in length ordered by shippers during a period previous to the adoption by the official Classification Committee of the scale of minimums as recommended by the Association, was from 70 to 92% of all cars ordered for such shipments, the proportion has decreased since the adoption of that scale to about 46%. The results at this point were attained when the recommendations of the Association were only in effect in the official classification territory. Undoubtedly, when the recommendations of the Association are generally adopted, the results will be even more pronounced.

It has been brought to the attention of the committee that some perplexity exists in the application of the recommendations of the Association as to the increasing and decreasing minimums owing to fractional lengths of freight cars now in service, and as it is wise to allow some latitude in the standard car minimums, as affected by the length, the committee therefore recommends the adoption of the following resolution:

Resolved, that 6 inches above any given length shall be rated as even length in feet of whatever length it may approximate. Lengths of over 6 inches shall take the minimum of the next greater length; thus, a length of 38 ft. 6 ins. shall be rated as a 38-ft. car; one of a fraction over 38 ft. 6 ins as a 39-ft. car.

Your committee has examined the question as to the classification committees and herewith reports the results of its investigations:

The official Classification Committee has adopted the recommendations of the Association in the increasing minimums for cars over 36 ft. in length, but has considered it unnecessary to make any decreased minimums for cars under 36 ft. in length.

Your committee has information that the failure to provide the decreased minimums for cars under 36 ft. in length in the official classification territory is working a hardship to railroads owning a large number of 34-ft. cars, and is inclined to believe that unless decreased minimums are made to apply to cars of that length, it will interfere with the general adoption of the standard box car.

The Western Classification Committee has

adopted for cars over 36 ft. in length increasing minimums of 3% per foot instead of the figures recommended by this Association, which are based upon the actual increase in the capacity, approximating 7½% per foot; and for cars under 36 ft. in length has reduced the minimums at the rate of 3% per foot instead of at the rate of 2½% per foot for 35-ft. cars, and 5% for cars 34 ft. or under, as recommended in the resolution of this Association.

The Southern Classification Committee advises through its chairman that the increase in minimums recommended by the Association will be adopted by that committee.

While we have no authoritative word from the Canadian Freight Association, we are informed that the Canadian railroads are likely to order cars of the dimensions recommended by the Association for all their new equipment.

Your committee greatly deprecates any departure in any particular from the recommendations adopted by this Association on Oct. 23, 1901. It is necessary, in order that the best results should be attained, that all the different classification committees should pursue the same course in reference to the standard box car. Without such uniform action, difficulties and differences are sure to arise which will increase as time goes on, and greatly interfere both with the object desired to be attained by this Association and with that harmony of action which is essential to its successful issue. For this reason your committee offers for the consideration of the Association and recommends for adoption the following resolution:

Resolved, That the Association considers it of great importance that all classification committees should adjust their scale of increasing and decreasing minimums to the scale recommended by this Association, and requests the Western Classification Committee to reconsider its schedule, and readjust its classification recently adopted.

It is the purpose of the committee to carefully watch the effect of the adoption of these new minimums in the other classification territories, and to report the results of its observations at the next meeting of the Association,

G.T.R. SEMI-ANNUAL MEETING.

The report presented at the semi-annual meeting in London, Eng., April 10, was published in our last issue. The President, Sir C. Rivers Wilson, in moving the adoption of the report and statement of accounts, said: "The half-year has been uneventful but prosperous. The volume of business has increased, more freight have been hauled, a larger number of passengers has been carried, our revenue has considerably increased, and our officers have continued their work of improvement on the lines throughout your system." Proceeding to examine the accounts in detail, he showed that while there had been 199,465 more tons of freight and live stock carried than in the corresponding half-year, there had been a decrease of £3,761 in the income, owing to the average rate per ton having fallen from 5s. 10¼d. to 5s. 7½d. The passenger income showed an increase of £130,425, brought about by an increase of 510,881 in the total number carried, and of 2d. in the average fare. The total gain in the receipts was £134,063. Of the increase in expenditure, £111,627, he showed that the extra cost of maintaining the permanent way was £44,429, of which the most important item was an increase of £25,688 in the repairs and renewals of bridges, £10,000 representing the increased amount credited to bridges renewals account, and the remainder being due to the expenditure on the renewal of certain bridges between Montreal and Toronto. The amount charged to maintenance of equipment showed an increase of £32,536. Owing to the difficulty of obtaining materials, there

had not been so much done in the way of renewals of engines and cars, but the funds available for this purpose have been increased by £43,052 and £14,925 respectively. The amount of £126,819 now standing to the credit of these funds is applicable to the replacement of the stock. The cost of conducting transportation had increased by £36,494, one-half of which was on fuel account, owing to heavier trains and increased consumption. Owing to the heavier engines now in use the train load had been increased 2.3 cars, and although 200,000 tons extra were carried, the train mileage had been reduced by 191,353 miles. The net revenue charges showed an increase of £8,487, and the net revenue credits a decrease of £5,053, making an adverse difference in the net revenue of £13,520. In the half-year the G. T. Western Ry. repaid £23,417, part of a sum of £30,822 advanced to the Chicago and G. T. Ry. in the previous year to pay interest on its 2nd mortgage bonds. The result of the working of the G. T. Western Ry. was a credit balance of £10,591, which is carried forward to the current half-year; and there is a surplus of £1,930 in the half-year's accounts of the Detroit, Grand Haven and Milwaukee Ry., as compared with a deficit of £5,426 in 1900. As to the future, the President said he believed he was echoing the opinion of the most competent men in

matters of American business in hoping within reasonable limits for a continuation of the present good times. The returns up to April 7 showed an increase of gross revenue for the current half-year of £45,000. During the half-year the addition to capital amounted to £198,838, £200,538 of 4% debenture stock having been issued at a premium, and £1,700 of bonds having been paid off. This increase is only nominal, as with the proceeds £86,800 Montreal and Champlain Jct. 5% bonds, and £95,800 Michigan Air Line 5% bonds had been paid off, and £538 issued in exchange for £615 Chicago, Detroit and Canada Grand Trunk Jct. 4% shares. The amount charged to capital account was £245,925, including £213,138, expended on the acquisition of bonds and shares of controlled lines, not previously included in the capital, whereby a saving of £2,000 had been effected. There had been £69,962 expended on new works, against which there were credits of £11,490 premium on stock issued, and £25,685 paid by the Royal Electric Co. for the privilege of carrying their cables over the Victoria jubilee bridge; the net result was that although £70,000 had been spent in improvements there would be an annual saving of interest of about £700. He hoped that with continued prosperity the time would come when the capital accounts would be practically closed and all

improvements would be paid for out of profits. "We are fortunately able," added Sir Rivers, "by the repayment at maturity of terminable securities bearing a higher rate of interest, or by acquiring such securities in exchange for debenture stock, to minimize to some considerable extent the increase in the fixed charges consequent on capital expenditure, and I find that although from Jan. 1, 1896, to Dec. 31, 1901, we expended on capital account, on actual improvements and additions to the property—and I speak without reference to revenue payments made for these purposes—including the expenditure to the latter date on the double tracking of the G. T. Western Ry., the sum of £1,650,000, which, at 4%, is equal to £66,000 a year, the net revenue charges of the system, including the G. T. Western and Detroit, Grand Haven and Milwaukee lines, only increased by £20,200 a year as compared with 1895, when you placed us in office. Of course, when the work of double tracking and improving the G. T. Western line is completed, there will be some increase in the interest charges on that line as compared with the past year, but even then there will be a considerable saving in the annual interest charges of the system compared with the interest on money actually expended on the improvement of the property."

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Referring to the renewal and strengthening of the bridges, Sir Rivers pointed out that the directors have been able to distribute the £110,000 appropriated to the work between Montreal and Portland over four years instead of five, as originally proposed. It had not been found practicable to complete the work on the Southern division, but the estimated cost had been charged to revenue and the amount stood at the credit of the renewal of bridges account. This enabled the Co. to bring into use heavier and more powerful locomotives, thereby increasing the average number of cars per freight train from 22.1 cars in Dec., 1895, to 28.2 cars in the present half-year. The standard car is now of 30 tons capacity—of which there are a considerable number—as well as a number of 40-ton coal cars. In 1895 the heaviest engine and tender was only slightly over 47 tons, whereas the present standard freight engine and tender is 91 tons. Out of the funds set apart from revenue the reconstruction of the bridges on the section between Portland and Montreal—297 miles—has been completed, with a portion of the bridges on the Southern division, and £110,000 has been applied towards the reconstruction of the Victoria bridge, and a certain amount has been spent in improving and rebuilding the bridges on the section between Hamilton and Niagara Falls. On the sections between Montreal and Hamilton and Toronto and Sarnia a considerable outlay is required to bring them to a proper state. It is proposed to allocate during the next five years for this purpose a few thousand pounds less per annum than the average of the sums actually charged out of revenue for the bridges in the last four years, and there is, therefore, no reason why the weight of this expenditure should be unduly onerous. One-third of the sum to be charged would be allocated to the June half-year, and two-thirds to the Dec., or more profitable half-year. The lines to Midland and to North Bay will have to be dealt with more or less in the same way.

Another very important portion of the work of improvement was the double-tracking of those portions of the line upon which the traffic was most crowded and where greater facilities are required. He said "A portion of our system the double-tracking of which we consider it is most essential should be brought to completion with the utmost expedition is that from Montreal to Chicago, 840 miles. That distance may be properly divided into three sections—from Montreal to Toronto, 333 miles—from Toronto to Port Huron, through the Sarnia tunnel, 172 miles—from Port Huron to Chicago, which is our G.T. Western line, 335 miles. On the first section, from Montreal to Toronto, we have already an excellent double track for the first 270 miles from Montreal to Port Hope. From Port Hope to Whitby Jct., 33 miles, we have only a single track. From Whitby Jct. to Port Union we are on the point of accomplishing the completion of a double track for 12 miles. The remaining distance to Toronto, 18 miles, has already been double-tracked. Therefore, upon the important section from Montreal to Toronto there remains only a gap of 33 miles. On the section from Toronto to Sarnia and Port Huron, we have two separate lines, one the northern line, the old G.T. main line, passing through Georgetown and Stratford, 172 miles; and the lower or more southern road, through Hamilton and London, 2 or 3 miles longer than by the northern road. These two lines, proceeding from the same point to the same point, constitute to all intents and purposes a perfectly efficient double track. The way it is worked at the present time is this: The gradients of the northern line are less advantageous than those of the southern line, the old Great Western line. The consequence is that it is the practice of our

officers to send the bulk of their eastbound freight traffic, which is the heaviest, by the lower road, and the return freight trains, which are much lighter, come back over the northern road; therefore, you see there is no necessity, under present circumstances, at all events, of contemplating the double-tracking of these lines which run through the peninsula of Ontario. Starting again on the other side of the St. Clair river from Port Huron to Chicago, with the means placed at our disposal under the reorganization of the G.T. Western road, we have taken in hand the double-tracking of that important portion of our system. 166 miles have already been completed, and 100 miles will be completed this year, leaving 60 or 70 miles to be finished in the early part of next year. Therefore upon the whole length of this 840 miles there only remains not taken in hand the 33 miles between Whitby Jct. and Port Hope; and your directors have come to the conclusion that no further time must be lost in taking up and accomplishing the conclusion of that work. The money which we have already spent in improving our line from Montreal to Toronto, cannot fructify to its full extent until you have a uniform double-track all along the lines, because the bad grades on the uncompleted portion fix the maximum load the engines can draw. We have therefore authorized our General Manager at once—and he strongly recommends this course to be pursued—to take the work in hand, and push it through, and he believes it can be done by the end of the year. Our position will then be that upon a most important portion of our system—the 840 miles I have been describing to you—we shall have a magnificent double-track the whole way. I may mention incidentally that the double-track between Niagara Falls and Hamilton will very shortly be finished."

In conclusion, Sir Rivers said: "We have begun the year under auspicious circumstances, from the fact that we have regained the services of that brilliant administrator, Mr. Hays—and I feel sure you will share the satisfaction of the board at his having returned to our Co. to continue the work which he conducted with such signal success for five years, beginning with 1896. I must also ask you to share the appreciation of the board of the services which have been rendered by Mr. Reeve during the period that Mr. Hays was not with us. Mr. Reeve came back to us when we were placed in circumstances of some perplexity and embarrassment. He most readily, and not without considerable inconvenience to himself, returned to us, and has put in one year of good work in our service. If we have gained something on the other side of the Atlantic, I am sorry to say that we have lost an old and faithful friend and servant on this side of the Atlantic. I allude to the retirement of our able and excellent secretary, Mr. Lindley, who has been connected with the Great Western Ry. of Canada and with the G.T.R. for very nearly half a century. He has given to the service of our Co. most assiduous and simple-minded devotion. Many of you know Mr. Lindley. Discreet, resourceful, of excellent judgment, and the most courteous of men, I consider him the very beau-ideal of what the secretary of a great company should be." Mr. Norman, the Assistant Secretary, who had completed 27 years in the Co.'s service, had succeeded Mr. Lindley.

The report and accounts for the half-year were adopted and the following dividends were authorized: 4% guaranteed stock, 2%; 1st preference stock, 2½%; 2nd preference stock, 4%.

The retiring directors, Sir C. Rivers Wilson, J. Price, G. Allen, and J. A. Clutton-Brock, were re-elected.

The meeting closed with a vote of thanks to the directors.

The Manufacture of Iron and Steel.

By R. R. Neild, Mechanical Department
C.P.R., Montreal.

The following paper was read at the last meeting of the Canadian Railway Club in Montreal:—

The subject I have chosen for this paper is one which I hope will be of interest to all members of this Club. It is one which is so extensive that it will be impossible for me to treat it in detail with any one paper, but I have endeavoured to briefly outline portions of this important industry in the hope that it will be the means of causing the members to more fully study this important manufacture. I will not pretend to touch on the early history of the manufacture of iron, as this would be sufficient for a paper in itself.

Iron with respect to its useful properties occupies the first place among the metals. By far the strongest and at the same time one of the lightest, its applications in the arts of construction are much more numerous than those of any other metal. Being capable of assuming, according to the treatment which it undergoes, the forms of wrought iron, cast iron and steel, it is susceptible of the widest variations in its character. Extracted from its ores in the form of cast iron, it is melted with comparative facility and according to the mode of operating, in the foundry, may be made to yield castings which are easily filed and turned or may be rendered so hard that no tool is able to touch it. By judicious treatment with heat and atmospheric air the cast iron is converted into steel, the strongest and one of the hardest and most elastic of all materials, as well as the only one of which a magnetic needle can be made.

Continued a little further the joint action of heat and atmospheric air converts the steel into wrought iron, possessing great strength and toughness, yet soft enough to be turned, bored and punched with ease and especially when heated to be rolled and twisted into the most varied forms without cracking. With less disposition to melt under the action of heat than any other common metal, wrought iron is sufficiently softened at a bright red heat to be welded or joined to another piece in the most perfect manner. Scarcely a step of importance has ever been made in the industrial progress of any community to which some one of the three modifications of iron has not been indispensable. Possessed of so many qualities, iron is still the cheapest of all the metals since the ores from which it is extracted are scattered in profusion through the crust of the earth, and can be made to yield the metal in abundance by a moderate expenditure of time, labour and fuel. Iron in the metallic condition or native iron is very rarely found in nature. Nearly all the specimens which have been examined have been meteoric iron, occurring in masses of irregular form, which have descended upon the surface of the earth, but whence they are derived is at present only a matter of speculation, such masses have been found to contain 93% of metallic iron, always associated with nickel and sometimes with small quantities of phosphorous, sulphur and carbon. They vary much in size. Two masses of iron, supposed to be of meteoric origin, have been found on the coast of Greenland weighing respectively 21 tons and 9 tons. Iron is most commonly found in a state of chemical combination with oxygen or sulphur which disguise its metallic properties and convert it into earthy or stony masses. The magnetic iron ore is the most important ore on this continent, and the iron extracted from it is generally of excellent quality. Red hæmatite is found abundantly in England, and its variety is exceedingly pure and furnishes iron of the very best quality, but is very difficult to smelt alone in the English

furnaces. Specular iron ore is the ore from which the excellent iron of Nova Scotia is extracted, and contains about 70% pure iron. The black brush ore of the Forest of Dean is a brown hæmatite and contains about 89% of the peroxide of iron, and yields most of the iron used in making tin plate. The most important British ore is the clay ironstone, clayband, and is found in great abundance in Staffordshire. Both this ore and the black band are found in layers which occur alternately with beds of coal, limestone, clay and shale, whence they are often spoken of as the ironstones of the coal measures, and the circumstance that the same pit or neighbouring pits will furnish the coal employed for

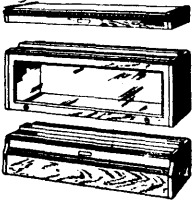
smelting the ore, the limestone used as a flux, and even the clay for making the fire-bricks for the furnace allows English iron to be produced at a price with which until lately other countries found it impossible to compete.

The difficulty of separating the "Fe," iron, from other substances with which it is associated in the ore is of course greater in proportion as these foreign matters are more numerous, thus when the iron is combined with oxygen only, as in the magnetic iron ore, the metal may be extracted at once in the form of malleable iron, by merely heating the ore in contact with carbon which combines with the oxygen. But in the clay ironstones the

earthy matter which is present renders such a process impracticable, and it is necessary to raise such ores to a much higher temperature in contact with lime to liquefy the clay so that it may be separated from the iron when the high temperature causes the iron to combine with the carbon of the fuel, forming cast iron from which the carbon is removed by a subsequent process in order to obtain wrought iron.

The ore to be smelted is broken up into lumps about twice the size of your fist, and in some cases it is found advantageous to prepare it for smelting by a preliminary process of calcining or roasting. For this purpose the ore is mixed with small coal and built up

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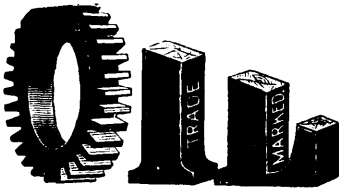


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The Government Crop Bulletin issued Dec. 12th, 1901, gives the following statistics for the year:

CROPS.		
ACRES.	AVERAGE YIELD.	TOTAL.
Wheat.....2,011,835	25.1 bus.	50,502,085 bus.
Oats.....689,951	40.3 "	27,796,588 "
Barley.....191,009	34.2 "	6,536,155 "
Potatoes...24,429	196 "	4,797,433 "

STOCK.

Number of stock in the Province, July 1, 1901:

Horses.....142,080	Sheep.....22,960
Cattle.....263,168	Pigs.....94,680
Value of Dairy Products.....\$926,314	

18,375 FARM LABORERS

Came from Eastern Canada to assist in the harvest fields of Manitoba in 1899—and the demand was not fully satisfied.

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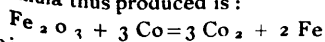
on a foundation of lumps of small coal into huge pyramidal heaps which are kindled at the windward side and allowed to smoulder for months, being prolonged as may be requisite by fresh additions of ore and fuel at the opposite extremity. The ore may be calcined with an addition of only one-twentieth of its weight of coal, if it contains, as in the black-band, a large proportion of bituminous or combustible matter; whilst a clay ironstone may require as much as one-fifth of its weight of coal. The calcination in heaps is very uncertain on account of the irregular distribution of the heat, some parts of the ore being scarcely affected, whilst others are overheated and melted so that they can be smelted only with difficulty.

This plan is only adopted in districts where fuel is very cheap. During this process the ore loses about one-fourth of its weight on account of the expulsion of water, "OH₂," and carbonic acid and the combustion of the bituminous matter. A portion of the sulphur is also burnt off, entering into combination with the oxygen from the air to form sulphurous acid gas. Many ores are rendered much more porous by this process, and are more easily smelted.

In South Wales the ore is roasted in furnaces or running kilns resembling lime kilns, into which it is thrown at the top alternately with layers of small coal, the roasted ore being raked out at the bottom of the furnace.

The usual process of smelting ores requires a very high temperature, and is carried out in a blast furnace. The blast furnace being at work or, as it is technically called, in "blast," it is kept filled to the top or throat by continually adding to the furnace, the smelting mixture of ore, fuel, and flux as the charge works down, the supply of air or blast under a pressure of from 2 to 5 lbs. in furnaces worked by coke or of 1½ to 2 lbs. in charcoal furnaces being maintained through the tuyeres near the bottom of the furnace, except when the top is opened for the introduction of the charge when the blast is shut off. The oxygen of the air injected through the tuyeres meeting with incandescent fuel is in a great measure immediately converted into CO₂, carbonic acid, with the production of the maximum amount of heat within a short distance of the tuyeres, the CO₂, carbonic acid gas, so produced ascending towards the throat of the furnace passes over a large mass of heated fuel and is quickly reduced to carbonic oxide, CO, each volume of CO₂ forming 2 volumes of carbonic oxide with a corresponding reduction of temperature in the lower part of the boshes where this is effected.

The CO, carbonic oxide, so produced, along with perhaps a smaller proportion derived from the deoxidation in the same manner of the carbonic acid expelled from the limestone used as a flux, then becomes the principal and active reducing agent in the blast furnace, ascending it meets the mixture of heated ore and flux which is descending towards the hearth; the porous oxide of iron thoroughly heated and calcined while in the upper part of the furnace is readily permeated by the gas with the reduction of metallic iron. The formula thus produced is:



The iron thus reduced to the metallic state in passing downwards towards the hearth of the furnace comes into contact with a large amount of heated fuel and combines with a varying amount of its carbon; a further carbonization being probably effected by the decomposition of carbonic oxide by the reduced metal with the production of the fusible of carbon and iron with various impurities constituting what is known as pig iron. It has been attempted to mark out with some considerable accuracy the various zones or limits within which the specific reactions occurring in the blast fur-

nace are confined. The cycle of operations by which the oxygen of the blast is converted into carbonic acid with its almost immediate reduction to carbonic oxide, in its turn again becoming CO₂ by its reaction upon oxide of iron, is repeated as the gases ascend through the furnace so long as the temperature remains sufficiently high to effect the decompositions; the escaping gases however always contain a large proportion of CO which burns with its characteristic flame though masked by the volume of yellow flame emitted at the mouth of the furnace if the gases are allowed to escape. The upper portion of the furnace is occupied by the raw materials charged into the furnace which are there being heated by the ascending gases; towards its lower boundary and within 20 ft. of the top of the furnace the mass is at a dull red heat and the ore suffers reduction by the contact with carbonic oxide with the production of a spongy metallic mass. A little lower down the limestone suffers decomposition and the descending spongy metal begins to absorb the carbon from contact with the fuel, which absorption continues through to where the temperature has attained a bright redness and it is here that the sulphur, phosphorus, silica are to a large extent reduced from the materials of the charge and combine with the pig iron. In the boshes the heat attains to a very bright redness and the descending charge of spongy metal with slag-forming materials undergo thorough fusion in their descent. In the crucible or hearth where the heat is at its greatest intensity, or whiteness, the fused metal and slag separate, the fluid pig iron forming the low stratum above which is the layer of fluid slag. If you add too much limestone for a flux the metal separates imperfectly. By thus adding a suitable material to flux, the pig iron separates from the slag in the hearth of the furnace, the latter rising to the top of the bath of molten metal and protecting it from oxidation by the action of the blast. The slag is allowed to run away through an opening and the metal is tapped out at intervals of 12 hrs., or in the hæmatite districts of the north every 6 hrs.; for this purpose the blast is turned off, the tap hole broken open by an iron bar and the metal runs into a series of grooves, furrows, or channels formed in the sand of the floor near the furnace or into cast iron moulds. The furrows are of the D section and arranged in parallel rows, the top end of each row communicating with a common channel along which the metal runs to supply the furrows in that row; this channel or feeder is known as the sow. The principal dimensions of the furnace recently erected at Middlesboro' are: diameter of hearth, 8 ft.; diameter at bosh, 28 ft.; total height from hearth to platform, 85 ft.; cubical capacity, 30,085 feet. This furnace is worked with hot blast at a temperature of about 1,100° Fahr., with a pressure of 3¼ lbs., and the product is stated to be from 490 to 500 tons of pig iron per week. A well-built furnace will often last five years without requiring to be blown out for repairs. The average tensile strength of pig or cast iron is about 7 tons per sq. inch. For the useful applications of cast iron 8 varieties are commonly recognized; nos. 1, 2 and 3 are decidedly grey irons of different shades, being the greyest; they are distinguished by the sparkling, largely crystalline appearance of the broken surface and are called melting iron because they are chiefly used for fine castings; no. 4 is best grey forge iron; no. 5 grey forge; they do not become so liquid when melted, but they are tougher and better fitted for purposes where strength is required; grey cast iron is usually regarded as the proper or normal product of a blast furnace in good working order.

To obtain iron in a fit state for rolling into strong bars it is necessary to deprive the cast

iron as far as possible of all foreign matters except a small proportion of carbon, of which a quantity not exceeding 1-200 is found to increase the toughness of the iron. To obtain this a process of puddling, either mechanically or otherwise, is generally employed. The charge of a puddling furnace consists of only 4 or 5 cwt. of pig iron, which is usually broken into fragments and piled in heaps around the sides of the furnace, and in about 20 minutes it begins to melt. If it were allowed to become very rapidly liquid the iron would be oxidized only to a slight extent upon the surface, and the object of the puddling furnace would be defeated; accordingly, a workman rakes the melting fragments into a cooler part of the hearth, and exposes fresh surfaces of the metal to the oxygen of the air in the furnace. The pig iron is placed in a furnace called a reverberatory furnace, where the metal is placed in small lumps on the hearth and the flame is reverberated back through an arch immediately on to the broken pig. The material is then worked until the whole of the metal has become fused to a pasty condition. This stirring is proceeded with while the metal froths and swells up very much and evolves numerous bubbles of carbonic oxide gas, indicating the removal of the carbon from the iron. In a short time small clotted lumps of the purified iron separate or come to nature in the melted metal; then it is not long before it is nearly deprived of its carbon, and purified iron has thus been separated and is then taken out and hammered under a heavy hammer, which strikes rapidly, and the melted slag is forced out in white hot showers from between the particles of iron and thus becomes welded together into a compact mass of metal of an oblong form which is rolled out into bars of 10 or 12 ft. long and 4 in. wide and sold as merchant bar iron. There are various methods of manufacturing wrought iron, but the subject is too extensive to deal with in this paper.

It has been stated that steel forms an intermediate link between ordinary cast and malleable iron and unites in a greater or less degree the properties of both. The following are the principal methods of making steel:

1. The Catalan forge directly from the ore.
2. From pig iron by fusion and partial oxidation in the hearth fusery.
3. From pig iron by a similar process in the puddling furnace.
4. By exposing bar iron to the action of solid carbonaceous matter at a temperature below its melting point. This method is known as conversion by cementation, and the amount of change produced is mainly dependent upon the time employed. When merely a surface coating of steel is required, the process is known as case hardening; while, if sufficiently long continued, the iron may be completely converted into cast iron. The process for making malleable cast iron is the reverse; viz., by exposing cast iron to heat in closed vessels filled with finely powdered hæmatite. The surface is decarburized at the expense of the oxygen of the peroxide of iron, with the production of a malleable coating. In the above process steel is produced without melting, and is converted into bars by hammering and rolling in a similar manner to malleable iron.
5. The cemented or blister steel produced in no. 4 is broken up into small pieces and melted in crucibles with or without fluxes, in quantities from 60 to 80 lbs. This is Huntsman's process, and is used extensively for cutlery and tool steel.
6. By blowing air through molten pig iron, until it is wholly or partially decarburized. The necessary amount of carbon is restored by the addition of highly carburized pig, such as spiegeleisen in small quantity. This is what is known as the Bessemer process.

The practice of melting steel was intro-

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1882	1,134	12,058 86	2,967 93	2 61	11.00
1883	2,210	9,493 68	10,857 65	4 91	4.73
1884	2,558	13,914 31	23,081 85	9 01	4.23
1885	3,642	26,576 99	29,802 42	8 18	7.76
1886	5,804	28,499 82	53,981 28	9 30	4.85
1887	7,811	59,014 67	81,384 41	10 44	5.78
1888	11,800	89,018 16	117,821 96	9 98	6.43
1889	17,349	116,787 82	188,150 36	10 84	5.85
1890	24,604	181,846 79	283,967 20	11 54	5.18
1891	32,303	261,436 21	408,798 20	12 65	6.40
1892	43,024	344,748 82	580,597 85	13 49	6.25
1893	54,484	392,185 93	858,857 89	15 76	5.47
1894	70,165	511,162 30	1,187,225 11	16 94	5.67
1895	86,521	685,000 18	1,560,733 46	18 03	5.50
1896	102,838	820,941 91	2,015,434 38	19 60	5.56
1897	124,685	992,225 60	2,558,832 78	20 52	5.67
1898	144,000	1,176,125 14	3,186,370 36	22 12	6.30
1899	163,610	1,430,200 33	3,778,543 58	23 09	6.50
1900	180,717	1,545,145 64	4,483,364 44	24 81	6.53

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duced by Huntsman at Sheffield in the year 1740, and is still carried on in substantially the same manner at the present day.

It is difficult to find the exact limit beyond which wrought iron passes into steel. Bar iron containing as much as two parts of carbon in 1,000 of metal would be so decidedly hardened by chilling as to be termed a steely iron, and a slight increase in the quantity would produce mild steel such as the homogeneous metal of which cannon and armour plates are forged. A proportion of carbon amounting to three parts in 1,000 is contained in the Bessemer steel rails, and in the steel of which spades and hammers are commonly made. Steel employed for tools commonly contains 10 or 12 parts of carbon in 1,000. When the carbon amounts to 14 parts in 1,000 the steel becomes more fusible and resembles white cast iron. Bar iron, which contains only a minute proportion of carbon has a tensile strength of about 57,500 lbs., nearly 26 tons, an inch; (the Board of Trade gives 5 tons a square inch as the working strain to which it is safe to expose bar iron in actual practice), but where the proportion of carbon amounts to three or five parts in 1,000 the tensile strength is increased to 90,000 or 100,000 lbs., 40 or 45 tons, a square inch, while it is still soft enough to be easily punched and flanged. Such a metal is well suited for boiler plates and similar purposes. The presence of carbon makes iron more capable of retaining magnetism. We will now commence to manufacture steel by what is known as the cementation process. The process of cementation, by which, until lately, nearly all English steel was produced, consists of heating bar iron in contact with charcoal in a closed chest until it has acquired a proper proportion of carbon. The cementation furnace is dome shaped, the hearth is divided by a grate containing a coal fire, the flame of which circulates all around the fireclay chests or pots placed on each side of the grate; these pots contain seven or eight tons of bar iron, together with charcoal necessary for its conversion into steel. A small opening is left at about the middle of one end of each chest through which the end of one of the bars undergoing cementation is allowed to project; this proof bar is withdrawn from time to time through a small hole in the wall of the furnace for the purpose of watching the progress of cementation. The charcoal is ground from hardwood, with which there are sometimes mixed a little common salt and some ashes of the charcoal. The bars of iron should be of the purest description if the best steel is to be produced. They are about 3 ins. broad, ½ in. thick. In order to fill the troughs the workman stands on an iron platform between the two, and sifts the cement powder into them so as to form a layer of ½ in. deep, upon which the bars are placed standing upon their edges, about 1 in. apart; more cement is then placed, and so on until the pots are filled. A temperature of about 2,000° Fahr. is required to enable the bar iron to acquire a proper proportion of carbon, and the pots are maintained at this temperature for a period according to the hardness of the steel required; four days being sufficient for producing steel of which saws and springs are made, while eight or ten days are required for the very hard steel of which cold chisels are made. The fire is then let down, and some days elapse before the troughs are cool enough to be opened. About three weeks are generally occupied in converting bar iron into steel; about 16 cementations a year are executed by a single furnace. The bars are found to have blisters on their surface, and so it is called blister steel. This blister steel is broken up into pieces of a convenient size for packing close together, and about 30 lbs. of it are introduced into a tall, narrow crucible about 2 ft. high, made of fire clay mixed with black lead, and provided

with a closely fitted cover. These are placed in a small furnace, holding six, twelve or more, about 6 ft. wide and 2 ft. deep. Hard coke, broken into small pieces, is employed to raise the crucible to a bright red heat; the steel is then introduced, the crucible covered, and the furnace filled with coke; when the steel is melted the crucible is lifted out, and its contents poured out into a cast iron mould previously heated. The mould is in two halves, closely fitted together, so that it may be coated inside with coal tar soot. For the production of large castings of steel the requisite number of crucibles must be emptied into the mould as nearly at the same time as possible. At the factory of Krupp, a casting of 16 tons may be produced in this way, 400 men well drilled to co-operate in emptying 1,200 crucibles so that the melted steel may flow into the gutters leading to the mould. But great improvements have been made in the manufacture of cast steel by the Siemens process and introduction of the regenerative gas furnaces. Cast steel has the serious defect of being brittle at a high temperature, so that it is forged with difficulty, and does not admit of being welded readily. A method of correcting this was patented by Heath in 1839, which consists simply in adding to the cast steel in the melting pot about 1-100 of its weight of Mn. CO₂, the result of the action of heat upon a mixture of black oxide of Mn. and charcoal or some other containing carbon, such as coal tar. The blades of knives are made of cast steel welded on to an iron tang. Siemens gas producers are rectangular chambers of fire brick; the combustible gases are hydrocarbons, the product of the distillation of coal in the upper portion of the producer; CO, formed by the reduction of the CO₂ produced at the firebricks by the combustion of the fuel which, passing over the heated coke or carbonaceous matters formed in the upper layers, combines with an additional atom of C with the production of 2 vols of CO, thus CO₂ + C = 2CO. The regenerators are vaulted chambers of firebrick placed beneath the furnace in which are stacked masses of brick work through which the air and gas is admitted into the furnace. The charge consists of 9% of pigiron, 6% of spiegeleisen; the process from the first to last occupies 10 hours. An average charge consists of 20% of pig, 20% Bessemer steel scrap, 10% rough puddled iron, 15% Siemens scrap, 15% old iron borings, 20% iron shearings, after which 7½% of spiegeleisen is added.

The simplest method of making steel is the Bessemer process, which depends solely upon the removal of the carbon by forcing air through the liquid metal, and if this process be arrested before the removal of the carbon is completed, the metal will have the composition of steel, but if all the carbon is burnt out so as to obtain wrought iron it is then converted into steel by adding spiegeleisen, which contains 82% of iron, 10% Mn., 1% Si., 4% C. The converter in which this process is carried on is made of wrought iron boiler plate and lined with fireclay or other refractory material to protect it from oxidation. It is generally large enough to contain 10 tons of cast iron for a charge and is suspended on trunnions so that it may be easily tilted for charging and discharging, a 6-ton converter is generally about 11 ft. high and 5½ ft. wide. Through the bottom of this vessel there are several openings to admit the blast of air which is blown in at a pressure of 15 to 20 lbs. a square inch, produced generally through a large blast engine for that purpose, through 35 holes from 7 tuyeres with 5 holes each. The converter, having been heated by burning a little fuel within it, is charged with pigiron which has been previously melted in a separate furnace, a pigiron containing a large proportion of graphite and silica and a small proportion of sulphur and phosphorus being selected. The air bubbling through the liquid

metal induces an intense combustion of the iron, producing a large quantity of the black or magnetic oxide of iron (the same as you see round a blacksmith's anvil) which is carried up by the force of the blast, together with the nitrogen of the air which does not act upon the iron. The bubbles of this gas being forced up through the melted metal effectually mix the unoxidized portion with the melted oxide, which converts the carbon of the cast iron into CO and the silica into silicic acid, the latter combining with some oxide of iron to form a slag which appears as a froth at the mouth of the converter. The silica is always oxidized before the carbon, and during the first ten minutes very little flame is seen at the mouth of the converter. In this process a portion of the iron itself is the fuel undergoing combustion, the temperature is much higher than that of the puddling furnace in which coal is the fuel, for a given quantity of oxygen in the act of burning iron produces 1-3 more heat than in the act of burning carbon. The operation usually lasts for only 20 minutes, its termination being indicated by the almost total disappearance of the flame of CO, but a far more exact method of ascertaining when the requisite amount of carbon has been removed consists of viewing the flame through a spectroscope, when the color is first yellow or orange, but it gradually changes to blue or violet as the amount of CO increases; the disappearance of these line marks indicates within a few seconds the conclusion of the process. If Bessemer iron were required the contents of the converter would now be discharged into a ladle, which is swung round to the mouth of the converter, and from the ladle into the moulds, situated around the pot, but to produce good malleable iron from this process very high priced pig has got to be procured, so this prevents the application of this process for the production of good malleable iron. In order to convert the decarburized metal into steel the requisite proportion of C is added in the form of spiegeleisen. A special variety of white cast iron containing a large quantity of carbon in chemical combination together with manganese, which is obtained by smelting in a blast furnace with charcoal a spathic iron containing a large proportion of manganese, such as that from the Brendon Hills (Somersetshire, Eng.) which contains: Fe., 83%; Mn., 10.71%; Si. 1%, and C, 4.32%. The presence of Mn. is probably of great importance with regard to the use of spiegeleisen as an ingredient of Bessemer steel. It is introduced in a melted state, generally melted in a cupola elevated above the level of the mouth of the converter, and run through channels in a molten condition into the mouth of the converter, which is tilted into a horizontal position to receive it; the blast being stopped during the addition, and afterwards turned on again for a few seconds when the converter has resumed its former position, in order to diffuse the spiegeleisen through the liquid iron, after which the steel is transferred to the mould, being poured for that purpose into a large ladle lined with loam and swung around the pit over the moulds arranged, the metal running out of the ladle from the bottom in which is placed a fire-clay plug. By this process 200 tons of steel weekly is produced which would require by the old process of melting blistered steel, 4,730 crucibles and 760 melting furnaces.

The effect of hammering, or rolling, increases the tensile strength, for the ingots of Bessemer steel which gave a mean tensile strength of 27 tons per sq. inch had it increased to 68 tons by hammering or rolling.

The proportion of carbon in the steel has such an important influence upon its properties that it is constantly necessary to determine its amount by chemical analysis.

The most simple and expeditious process is that due to Eggertz. Iron containing com-

bined carbon dissolves in nitric acid with a brown color, the depth of which is proportionate to the quantity of carbon present. The color produced is then compared with that of standard tint equivalent to a known quantity of carbon.

It is generally allowed that Si., S. and P. are injurious to steel, but it is undecided as to the proportions of each that may be present without serious deterioration. There appears to be little question that steel containing five parts of Si. in 1,000 does not admit of being forged. S. confers red shortness upon steel as it does upon bar iron, but the former appears to suffer less injury than the latter from the presence of a given proportion of sulphur. Steel containing more than two parts of sulphur in 1,000 is decidedly brittle at a red heat so that it is useless for forging and can only be employed for castings, for which purpose it is adapted by its increased fluidity when melted. Red short steel like iron, having the same defect, appears tougher than other qualities of steel except at an elevated temperature. Mn. is believed to counteract to a great extent the red shortness caused by the presence of sulphur in steel. How much phosphorus can be tolerated in steel has been made the subject of much discussion. It is said that steel manufacturers object to bar iron as a material for converting into steel when it contains one part of phosphorus in 1,000. A ready test for distinguish-

ing between steel and wrought iron consists in placing a drop of diluted nitric acid upon a clean surface of metal, when a greenish-grey stain appears upon the iron, whilst the steel exhibits a black spot due to the separation of carbon.

PURCHASING AGENTS' GUIDE.

(Continued from third page of Cover.)

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Duff Manufacturing Co..... Allegheny, Pa.
W. H. C. Mussen & Co..... Montreal.
A. O. Norton..... Coaticook, Que.
- Track Tools**
F. E. Came..... Montreal.
Canada Switch and Spring Co..... Montreal.
James Cooper..... Montreal.
Rice Lewis & Son..... Toronto.
W. H. C. Mussen & Co..... Montreal.
- Tramway Equipment**
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- Trucks (Electric Car)**
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- Trucks (Warehouse and Express)**
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Dominion Bridge Co..... Montreal.
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- Vessels**
Polson Iron Works..... Toronto.
- Waste**
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Canada Southern Railway Company.

THE Annual General Meeting of the Canada Southern Railway Company, for the election of Directors and other general purposes, will be held on Wednesday, the 4th day of June, 1902, at the hour of eleven o'clock in the forenoon, at the Company's Head Office, in the City of St. Thomas.

NICOL KINGSMILL,
May 1st, 1902. Secretary C.S. Ry. Co.

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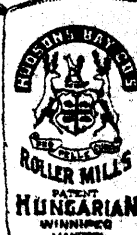


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