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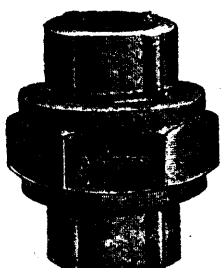
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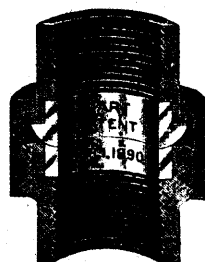
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TORONTO, CANADA, DECEMBER, 1900.

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Rebuilding Niagara's Cantilever.

By O. E. Dunlap.

Determined that its bridges shall be fully able to meet all the requirements of modern railroading, the Michigan Central R.R. is reconstructing its famous cantilever bridge over the Niagara gorge. This bridge was erected in 1883, & its building has gone down in history as one of the great engineering feats of that year. It was commenced about the middle of April, & it was completed by Dec. 1 following. When it was tested on Dec. 20, 1883, two trains, each containing 10 locomotives & 12 loaded platform cars, were run over the structure. The cantilever bridge is a double-track affair, & it stood the test without any signs of weakness. When these two trains were on the bridge, the whistles of all the locomotives broke forth at once, announcing the success of the test & the acceptance of the bridge. Then it was thought the structure would meet all demand likely to be made upon it during that generation, but in the 17 years that have gone by there have been numerous changes in railway methods & equipment. Then a car containing 20,000 lbs. was a big car; to-day there are cars that carry 60,000 & even 80,000 lbs. At the same time the hauling capacity & the weight of locomotives have been on the increase, so that there has been a general revolution of capacity & haulage on all the great railways throughout the country, & consequently the strains upon the bridges have been proportionately increased.

It is understood that the Niagara cantilever was the second bridge of the kind erected in the U. S. It spans the gorge right at the head of the whirlpool rapids, 300 ft. above the lower or railway steel arch. In length the cantilever is 910 ft. It is divided into 2 cantilever arms & a fixed span. One cantilever arm is 375 ft. long, & the other 395, while the fixed span has a length of 125 ft. The cantilever arms rest upon the towers that rise from the water's edge on each side of the river. These towers are about 130 ft. high. The total weight, supposed to rest on the columns of the towers, is about 1,600 tons, & the distance across the river, from tower to tower, is in the neighborhood of 500 ft. The shore ends of the cantilevers are held firmly by stone abutments erected at the edge of the high bank. The deck of the bridge is 200 ft. above the water. When the bridge was built huge false work structures were used, the work progressing from the shore ends & finishing in the center.

In the general rebuilding & strengthening

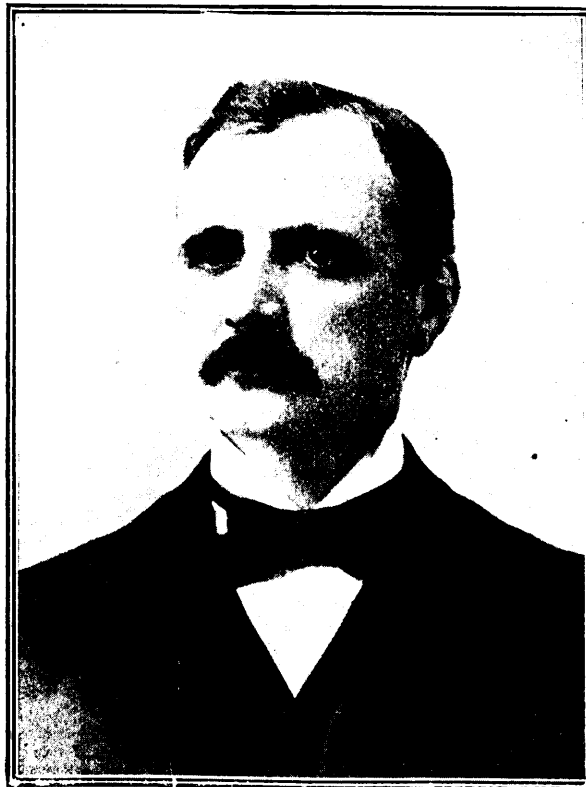
of bridges throughout the country it is very probable that no structure has received such novel treatment as the M.C.'s cantilever. The bridge was not to be wholly replaced by a new structure, but the magnitude of the work undertaken required that unusual means be employed to strengthen it. These conditions have been nicely and successfully met by the M.C. engineering force in Detroit, of which B. Douglas is the head. The work of reconstruction consists of inserting a center truss in the structure, & by this means the carrying capacity of the bridge will be increased 75%. In all over 1,800 tons of new iron have been

up to the point where the bottom chord of the new truss is located. The piece of bottom chord placed between the columns of the towers weighs about 14 tons, & on each end of it there is a 7-ton casting that connects the section of chord into the tower. Stretching up from this casting there is a section of iron 55 ft. long, & this extends to the top chord of the new truss. On top of this leg there is a 6-ton casting to connect the top chord to the tower. All the iron parts placed in the new truss are about three times heavier than the iron in the old trusses. In the further construction of the new truss sections of the bottom chord were let down, & they were followed by posts to make the connection between the upper & lower chords. The sections of the bottom chord weigh about 15 tons, while the weight of the posts is from 6 to 9 tons. In this way the new truss has been added to the bridge, forming a new bond between the U.S. & Canada.

Some of the new iron was unloaded on the New York side & some on the Canadian side, & the several parts were run out on the bridge on a small car. On the deck of the bridge there is erected a travelling derrick that is 28 ft. long, 28 ft. wide in the clear, 21 ft. clear of track, & 30 ft. high. On each side it has a platform on which are friction engines with 2 winches. This derrick is equipped with 10-ton blocks, & in order to lower the castings over 3,500 ft. of 1½-inch manilla line was used. In order that the iron might be lowered to the point where it was designed to fit, the method was employed of cutting off the ends of the ties between the double tracks, & by this means an opening 6 ft. wide by 11 ft. long between the laterals was obtained. Through such openings all the iron was lowered. Some of the pieces of iron placed were over 50 ft. long, & on the occasion of lowering these long pieces it was found necessary to move the traveller forward in order that the iron might be tipped up. This moving of the traveller was accomplished by men manning a line on each side.

On each side of the river, between the tower & the cliff, there is a shore arm of the upper chord. These shore arms are about 53 ft. long, & each weighs 28 tons. In the bridge, as originally built, the laterals were about 30 ft. long and stretched from one post to another across the bridge at an angle. In the new construction the laterals extend from the outer posts to the new center posts. New suspension bars were put in, & they carry from the top of one post to the base of the adjoining tie bar. These bars vary in size.

One of the interesting feats accomplished during the progress of the work was the severing of some of the huge steel floor beams in



W. H. KELSON,

General Storekeeper, Canadian Pacific Railway.

placed in the bridge, & a remarkable fact is that this has been accomplished without changing the outward appearance of the bridge.

When it was decided to insert the new truss, 2 new piers of substantial masonry were built between the old piers on each side of the river. On top of the piers steel shoes weighing 10 tons each were placed, & from these shoes new center columns were built up through the towers. On top of these shoes 5 sections of steel, weighing about 12 tons to a section, & each 25 ft. long, were erected. This brought the new columns of the towers

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First-Class Railroad Superintendent.

Wanted to assume charge of a section of a Canadian
railroad, part of which is now being constructed. Must
have office training in addition to practical knowledge of
transportation service, and maintenance of roadbed and
structures.

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order that the new iron might be given pro-
per place. From the floor beams referred to,
sections 2 ft. 2 in. wide were cut. This cut-
ting was done by drilling holes through the
iron, close together, & then cutting out the
intersections. While this was going on the
floor beam under treatment was supported by
timbers that rested on the outer trusses.

When the cantilever bridge was erected in
1883, the use of compressed air for the opera-
tion of drills, etc., was quite unknown, but in
the years that have elapsed the steps of pro-
gress in its application have been notable. All
the riveting on the original bridge was done
by hand, but on the new work the service of
compressed air has been brought into play
for riveting, drilling & chipping. The plant
that supplies the power is located on the New
York bank under the approach to the bridge
proper. In it there is one 12 h.-p. & one 24
h.-p. gasoline engine. Of the other apparatus
there is in use on the work a piston air drill,
a "Little Giant" drill, two long-stroke pneu-
matic hammers & one ooo pneumatic hammer.
From the compressor plant a 2-in. service
main is run across the bridge, & from this
hose connections are made to the point of ap-
plication or use.

Of course, the reconstruction of the bridge
to this extent called for a reinforcement of the
anchorage. The original anchorages were
about 26 ft. long & ran down to the bottom of
the masonry abutment at the edge of the high
bank. To provide additional anchorage the
side of the abutment was opened, & a hole 16
ft. deep made in the solid rock under the
abutment. At the bottom of this excavation
cupboards were opened about 7 ft. wide & 12
ft. long. In these 7 I-beams, each weighing

900 lbs., were placed & the anchor bars car-
ried down to them, making the total depth
about 40 ft. The opening was then filled
with concrete.

The work on the reconstruction of the can-
tilever has been carried on without interfering
with the regular traffic over the structure, &
it is expected that it will be completed by Jan.
1, 1901.

D. Coughlin is the superintendent in charge
of the work. He has had a very extended ex-
perience in bridge building during the last 35
years. For 10 years he was with the Lake
Shore road, & for the last 11 years he has
been employed by the Michigan Central. He
it was who, when the Ashtabla bridge disaster
occurred, threw up 2 spans of the Howe truss
wooden bridge over the wreck in 8½ days,
each span being 157 ft. long, & the height
above the water being a little over 84 ft. The
assistant engineer in charge of the work is G.
C. Tutbill, of Detroit.—Modern Machinery.

Grand Trunk Subsidiary Companies.

The following annual reports for 1899 have
recently been issued:—

CHICAGO & GRAND TRUNK RAILWAY.

Consequent upon the maturity of the 1st
mortgage bonds the necessity for a re-organi-
zation of the capital of the Co. upon a per-
manently sound basis was intimated to holders
of the 1st & 2nd mortgage bonds by circular
letter of the President, October 17, 1899. The
plan of re-organization therein, set forth has
been accepted by all interests with the modi-
fication that the 2nd mortgage bond-holders
are to get the 25% reduction that was made
in their bonds, in 50 year 4% income bonds,
the re-organized Co. retaining the right to
purchase the said bonds any time within 10
years at 85c. on the dollar. In this connec-
tion the G. T. R. Co. has undertaken to make
its traffic guarantee of 1st mortgage bond in-
terest absolute & unconditional.

There having been no resources for the
satisfaction of the 1st mortgage bonds at ma-
turity, Jan. 1, 1900, application was made to
the Circuit Court of the U. S. for protection,
& E. W. Meddaugh & H. B. Joy were ap-
pointed receivers, which office they have ex-
ercised since Jan. 3, 1900.

The leases of the Cincinnati, Saginaw &
Mackinaw, & Toledo, Saginaw & Muskegon
lines having proved detrimental to the inter-
ests of this Co., as shown by the Special
Master who reported upon those connections
under date of June 28, 1900, were abandoned
from July 1, 1900, as regards this Co.

There being now no complications affecting
the title of the property as held by the Court,
the requisite procedure for its release is in
progress.

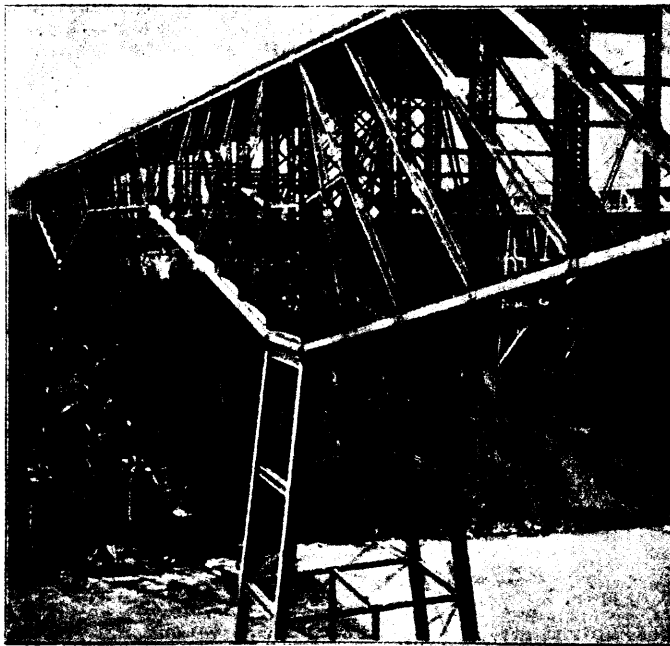
The gross receipts, working expenses, net
revenue & net revenue charges for the year
compared with 1898, were:

1898		1899
\$ 84,223.87	Passengers	\$ 987,778.80
129,495.72	Mails & express	137,130.87
4,673,652.72	Freight & live stock	2,769,415.06
3,346.49	Miscellaneous receipts	5,686.33
\$3,649,718.80	Total gross receipts	\$3,900,011.06
2,890,297.27	Working expenses & taxes	3,287,964.24
\$ 759,421.53	Net revenue	\$ 612,046.82
87,100.08	Net revenue charges includ- ing interest on bonds	883,041.68
111,678.55	Paid by G. T. R. under traffic agreements	270,994.80
435,175.53	Net revenue deficiency carried forward from Dec. 31, 1896.	435,175.53

The passenger receipts, including mails &
express, amounted to \$1,124,909.67
Against 972,719.59

An increase of \$ 152,190.08
of which mails & express contributed \$7,635.15.

The average earnings per passenger per
mile were .79 against .73 cents, & there were
carried 1,242,545 passengers against 1,161,7
094, an increase of 81,451.



MICHIGAN CENTRAL RY. CANTILEVER BRIDGE, NIAGARA FALLS, ONT.

The receipts from merchandise traffic amounted to :

Against..... \$2,769,415.06 for 2,535,821 tons.
2,673,652.72 for 2,111,884 "

An increase of 95,762.34 or 3.58% 423,937 "

The receipts per ton were \$1.09 against \$1.27, & the yield per ton per mile $\frac{1}{10}$ ths. of a cent, against $\frac{1}{10}$ ths. of a cent.

The working expenses, including taxes, amounted to :

\$1,287,964.24 or 81.31% of the gross receipts.
Against 2,890,297.27 or 79.19% of the gross receipts.
Showing an increase of \$397,666.97 or 13.76% against an increase in the gross receipts of 6.86%
The total engine miles were 4,145,166 against 3,882,199.
The total car miles were 71,210,766. against 66,041,655.

The deficiency of net revenue to meet interest charges was \$270,994.86, against \$111,678.55, & the G.T. Co. contributed the required amount in terms of the traffic agreements, taking security as usual.

The capital account & balance sheet of the Co. at Dec. 31, 1899, are as follows :

CAPITAL ACCOUNT.

Capital Stock, (60,000 shares at \$100 each). \$ 6,600,000.00	
First Mortgage Bonds dated 1st Jan., 1880, due 1st Jan., 1900, (interest 6% per annum, payable 1st Jan. & 1st July)..... \$6,000,000	
Second Mort. Bonds dated 1st Jan., 1882, due 1st Jan., 1922, (interest 5% per annum, payable 1st Jan. & 1st July)..... 6,000,000	
	12,000,000.00
Balance overspent carried to General Balances..... 960,204.49	
Cost of line & rolling stock..... \$19,560,204.49	

BALANCE SHEET.

Interest accrued on bonds..... \$ 216,643.59	
Sundry outstanding accounts due by the Co. G.T.R. Co. advances under traffic agreements..... 3,478,329.52	
Toledo, Saginaw & Muskegon Ry. interest coupons held for advances under traffic agreement..... 146,699.49	
Cincinnati, Saginaw & Mackinaw R.R. Co., ditto..... 157,827.99	
	\$5,393,317.14
Balance of capital account (brought down)..... \$ 960,204.49	
Balance of net revenue account (a deficit)..... 435,175.53	
Cash in hands of London agency..... 1,397.59	
Securities on hand..... 134,000.00	
Sundry assets..... 79,682.62	
G.T.R. Co.'s interest coupons pledged as security for advances under traffic agreements..... 3,478,329.52	
Toledo, Saginaw & Muskegon Ry. Co. for advances under traffic agreement..... 146,699.49	
Cin., Saginaw & Mack. R.R. Co., ditto..... 157,827.99	
	\$5,393,317.14

The Chicago & Western Indiana & Belt railways were again operated to advantage. The former paid dividends at the usual rate of 6% per annum, the latter paying 6% per annum for the first half, & 8% per annum for the last half of the year.

The Toledo, Saginaw & Muskegon Ry. accounts show net revenue for the year of \$25,189.89, against \$23,837.57 for 1898. The interest on the bonds of that Co. amounted to \$83,100, towards which this Co. paid \$12,806.20 under the traffic agreement.

The Cincinnati, Saginaw & Mackinaw R. R. accounts show a net revenue of \$40,062.91, against \$26,509.77 for 1898. The interest on the bonds of that Co. amounted to \$86,450, towards which this Co. paid \$21,227.56 under the traffic agreement.

GRAND TRUNK JUNCTION RAILWAY CO.

The debt of this Co. for expenditure in excess of its capital powers, being the cost of additional facilities for the C. & G.T.R. Co., under agreement of Nov. 16th, 1885, last reported & now standing at \$223,246.80, has been transferred to the G.T.R. Co. for settlement in connection with the re-organization of the C. & G. T. Co.'s capital accounts.

Both the Chicago & Western Indiana & Belt companies paid regular dividends, the former at the rate of 6% per annum, & the latter at the rates of 6 & 8% per annum respectively for each half of the year, your Co.'s proportions having been applied towards payment of the bond interest through the C. & G. T. Co. in the usual course.

The Atchison, Topeka & Santa Fe Co. continue to satisfactorily carry out its rental engagements.

DETROIT, GRAND HAVEN AND MILWAUKEE RY. CO.

No charges have been made against capital during the year.

The gross receipts, working expenses, net

revenue & net revenue charges for the year, compared with the previous year were:—

1898.	Gross Receipts.	1899.
\$368,043.00	From passengers.....	\$400,433.77
495,909.82	" freight & live stock.....	536,623.74
51,199.63	" mails & express freight.....	50,960.16
23,079.85	" miscellaneous receipts.....	14,858.32
\$938,232.30	Total gross receipts.....	\$1,002,875.99
699,872.93	Working expenses & taxes.....	724,709.59
\$238,359.37	Net revenue.....	\$278,166.40
305,686.45	Interest on bonds, &c.....	362,261.06
\$127,327.08	Deficiency.....	\$84,094.66

The deficiency was paid each 1/2-year by the G.T.R. Co. of Canada, successor of the Great Western Ry. Co. of Canada, according to guaranties of the latter Co.

There was an increase of 63,672 in the number of passengers, & of \$32,390.77 in the passenger receipts, compared with 1898. The travel between Detroit, Royal Oak, Birmingham & Pontiac decreased 17,474 passengers, & \$3,502.64 in the passenger receipts, owing to the continued competition of the electric railway. The average receipts per passenger were 63.29c. against 63.87, the average rate per passenger per mile 2.11c. being the same as in 1898, the average receipts per passenger train mile 85.98c. against 71.31, & the passengers carried one mile 18,702,990 against 16,924,194.

The freight receipts increased \$40,713.92, & the number of tons 76,446. The local & through tonnage compare as follows:

	LOCAL.		THROUGH.		TOTAL.	
	East Bound.	West Bound.	East Bound.	West Bound.	East Bound.	West Bound.
1899.....	386,249	220,030	91,490	12,718	477,739	232,748
1898.....	326,000	202,737	96,371	8,380	422,371	211,117
Increase.....	59,666	17,293	.....	4,338	54,815	21,631
Decrease.....	.....	.....	4,881	.....	.....	.....

The increased tonnage was principally in grain, 15,594 tons; flour, 9,857 tons; mill products other than flour, 12,803 tons, & ores 19,618 tons; the principal decreases being



MICHIGAN CENTRAL RY. CANTILEVER BRIDGE, NIAGARA FALLS, ONT.

The Railway and Steamship Folder Display Co.,

with which are incorporated

The National Railway and Steamship Advertising Co of Canada.
The Railway Folder Advertising Co. of Ontario, Ltd.
Joseph Simpson's Railway and Steamship Advertising Agency

Head Office - 16 Manchester Building, Melinda Street, Toronto, Canada.

Branch and Distributing Office,—111 Union Station, Toronto.

The Company undertakes the display and distribution of railway, steamship, land, exhibition, hotel and other advertising folders, maps, hangers, calendars, posters, pamphlets, etc., throughout the whole of Canada and Newfoundland,

By distributing them to railway and steamship ticket agents, hotels, etc.

By displaying folders in racks in stations, ticket offices, hotels, etc.

The Company's distribution lists, which are copyrighted, are official and up-to-date, and are periodically revised by the general passenger departments of the various transportation lines. They are the only complete lists of Canadian ticket agents in existence.

For convenience in operation the Company's system is divided into five districts, as follows :

1. The Province of Ontario.
2. The Province of Quebec.
3. The Provinces of New Brunswick, Nova Scotia and Prince Edward Island and Newfoundland.
4. The Province of Manitoba and the Northwest Territories.
5. The Province of British Columbia.

The Company makes contracts for the display and distribution of matter in any or the whole of these districts, and invites enquiries for terms and full particulars of the service.

LIST OF RAILWAYS COVERED.

The Company's distribution embraces all ticket agents on the following railways in Canada and Newfoundland :

Alberta Ry. & Coal Co.	Elgin & Havelock.	New York Central & H R.
Albert Southern.	Esquimault & Nanaimo.	Niagara, St. Catharines & Toronto.
Atlantic & Lake Superior.	Grand Trunk.	Northern Pacific.
Bay of Quinte.	Great Northern of Canada.	Nova Scotia Steel Co.
Boston & Maine.	Great Northern, U.S.A.	Orford Mountain.
Brockville, Westport & Sault Ste. Marie.	Hampton & St. Martin.	Ottawa & Gatineau.
Buctouche & Moncton.	Irondale, Bancroft & Ottawa.	Pontiac Pacific Junction.
Canada Atlantic.	Kent Northern.	Prince Edward Island.
Canada Coals & Ry. Co.	Kingston & Pembroke.	Quebec Central.
Canada Eastern.	Kootenay Ry. & Nav. Co.	Quebec & Lake St. John.
Canadian Northern.	L'Assomption.	Quebec Southern.
Canadian Pacific.	Lake Erie & Detroit River.	Salisbury & Harvey.
Caraquet.	Lotbiniere & Megantic.	Shore Line, N. B.
Carillon & Grenville.	Maine Central.	Spokane Falls & Northern.
Central Ontario.	Michigan Central.	Sydney & Louisburg.
Central of New Brunswick.	Midland of Nova Scotia.	South Shore, Que.
Central of Nova Scotia.	Montford & Gatineau Colonization.	Temiscouata.
Central Vermont.	Nelson & Fort Sheppard.	Tilsonburg, Lake Erie & Pacific.
Cumberland Ry. & Coal Co.	New Brunswick & P.E.I.	Thousand Islands.
Dominion Atlantic.	Newfoundland.	Toronto, Hamilton & Buffalo.
	New York & Ottawa.	Victoria & Sidney, B.C.

stone, sand, &c., 7,048 tons; anthracite coal, 6,397 tons; ice, 4,037 tons, & live stock, 2,567 tons. There were 31,000 tons of grain from Milwaukee against 27,901 tons in 1898. The rate per ton per mile on all freight was 1.23c., against 1.28, & the freight receipts per train mile \$1.53.60 against \$1.33.83; the freight tons moved one mile being 43,583,442 against 39,056,704. The decrease in miscellaneous receipts is caused by a re-arrangement of receipts & expenses.

The working expenses, including taxes, were 72.26% of the gross receipts, against 74.60% for 1898.

	1899.	1898.
Passenger train mileage.....	524,839	473,983
Freight & mixed train mileage.....	349,512	400,836
Total train mileage earning revenue.....	874,351	873,819
Piloting, shunting, & light running engine miles.....	306,052	254,124
Total traffic engine miles.....	1,180,403	1,127,943
Passenger car miles.....	2,329,092	2,114,763
Freight ".....	6,888,849	6,373,093
Total.....	9,217,941	8,487,856

Referring to the report for 1897 & 1898, the breaking up of old locomotives & cars, & their replacement, is still in hand.

The capital account & balance sheet of the Co. at Dec. 31, 1899, are as follows:

CAPITAL ACCOUNT.

By 30,000 shares at \$50 each.....	\$1,500,000 00
Equipment mortgage bonds dated Nov. 14, 1878, due Nov. 14, 1918, interest 6% per annum payable April 1, & Oct. 1.....	\$2,000,000
Consolidated mortgage bonds dated Nov. 15, 1878, due Nov. 15, 1918, interest 6% per annum payable April 1, & Oct. 1.....	3,200,000
Amount borrowed under mortgage on land at Detroit, & bond.....	226,000 00
Balance carried down.....	138,234 67
	<u>\$7,064,234 67</u>
To cost of the line & rolling stock at Dec. 31, 1898.....	\$7,065,492 33
Deduct amount received from city of Detroit, for land taken to open Warren Avenue, less amount paid city.....	1,257 66
	<u>\$7,064,234 67</u>

BALANCE SHEET.

By balance of capital account, being over-expenditure at Dec. 31, 1899.....	\$ 138,234 67
Cash in hand at London agency.....	6,208 80
Sundry assets.....	9,121 56
Balance of mortgage on steamers.....	285,000 00
G.T.R. Co. for interest coupons pledged as security for payments under guaranties.....	1,630,477 02
	<u>\$2,069,042 05</u>
To interest accrued on bonds since Oct. 1, 1899, etc.....	80,499 40
Sundry amounts due by the Co.....	358,074 63
G.T.R. Co. for payments under guaranties.....	1,630,477 02
	<u>\$2,069,042 05</u>

TOLEDO, SAGINAW AND MUSKOGON RY. CO.

1898.	GROSS RECEIPTS.	1899.
\$ 22,249 35	From passengers.....	\$ 23,329 94
84,471 21	From freight & live stock.....	83,600 68
7,263 65	From mails & express freight.....	7,310 31
17,746 10	Miscellaneous receipts.....	19,087 36
\$131,730 31		\$133,328 29
107,892 74	Working expenses & taxes.....	108,138 40
	1899.	
	81.90% of the gross receipts \$1.11	
\$ 23,837 57	Net revenue (applied to excess of working expenses & taxes over receipts at Dec 31, 1898.).....	\$ 25,189 89
83,100 00	Interest on bonds issued.....	83,100 00
\$ 59,262 43	Deficiency.....	\$ 57,910 11
	Bond interest due for 1899, as above.....	\$ 83,100 00
	Amount of interest paid for 1899, being amounts received under traffic agreement of May 10, 1888, with the following companies:	
	From G.T.R. Co.....	\$40,976 72
	From C. & G.T.R. Co.....	12,806 20
		<u>\$53,782 92</u>
	Bond interest short-paid for 1899.....	\$29,317 08
	Bond interest short-paid for 1898.....	\$31,275 26

1899.	1898.
Passenger train mileage.....	77,440
Freight & mixed train mileage.....	73,988
Train miles earning revenue.....	151,428
Piloting, shunting, & light-running engine miles.....	8,763
Total traffic engine miles.....	160,191
1899.	1898.
Passenger car mileage.....	193,747
Freight car mileage.....	891,341
	<u>1,085,088</u>

The number of passengers carried was 40,048, against 37,765, & the number of tons of freight 103,703, against 98,918. The increased tonnage was principally lumber, 7,377 tons; hay, 3,028 tons; potatoes, 2,490 tons; anthracite coal, 1,058 tons; bituminous coal, 1,511 tons; & cement, brick & lime, 513 tons; the principal decreases being grain 5,105 tons; & fruit & vegetables, 3,288 tons.

BALANCE SHEET AT DECEMBER 31, 1899.

Capital Stock (16,000 shares at \$100 each).....	\$1,600,000 00
First mortgage bonds issued, due July 1, 1918, secured by mortgage, dated July 2, 1880, for \$1,734,000.00, interest at 5% per annum, payable Jan. 1 & July 1.....	1,662,000 00
Balance carried down.....	1,798 35
Cost of line & rolling stock.....	\$3,263,798 35
To bond interest unearned & unpaid.....	\$ 370,563 35
To C. & G.T.R. Co. for supplies, for which bonds are pledged, per contra.....	102,000 00
To G.T.R. Co. for advances.....	5,038 65
To G.T.R. Co. for advances under traffic agreement.....	341,127 51
To C. & G.T.R. Co. for advances under traffic agreement.....	146,699 40
	<u>\$ 965,428 91</u>
By balance brought down, being over expenditure on capital account.....	\$ 1,798 35
By balance of net revenue account (deficiency).....	373,593 74
By this Co.'s bonds pledged, per contra.....	102,000 00
By sundry accounts due to this Co.....	209 91
By G.T.R. Co. for bond interest coupons pledged as security for advances under traffic agreement.....	341,127 51
By C. & G.T.R. Co. for ditto.....	146,699 40
	<u>\$ 965,428 91</u>

CINCINNATI, SAGINAW & MACKINAW R.R. CO.

1898.	GROSS RECEIPTS.	1899.
\$ 35,599.82	From passengers.....	\$ 37,773.32
95,274.09	From freight and live stock.....	117,236.37
5,970.84	From mails and express freight.....	5,646.14
831.23	Miscellaneous receipts.....	585.01
\$137,675.98		\$161,240.84
111,166.21	Working expenses and taxes.....	120,277.93
	1899.	
	80.74% of gross receipts.....	74.60
\$ 26,509.77	Net revenue.....	\$ 40,962.91
86,450.00	Interest on bonds issued.....	86,450.00
\$ 59,940.23	Deficiency.....	\$ 45,487.09
	Deduct: Payments by the following companies, under terms of agreement of Oct. 2, 1890, between them, the C. S. & M. R. Co., & A. W. Wright & others, being 25% of the following companies gross receipts from freight & passenger traffic interchanged with the C. S. & M. R. R. for the year.	
	1898.	1899.
\$13,533.16	Paid by C. & G.T.R. Co.....	\$21,227.56
9,000.20	Paid by G. T.R. Co.....	11,275.42
\$22,533.36		\$32,502.98
	Also a payment by C. & G. T. R. Co., under terms of agreement of Oct. 2, 1890, between the G.T.R. Co. and it, being excess of cost of operating the C. S. & M.R.R. over 70% of its gross receipts for	
37,326.38	14,793.02	7,409.34
\$ 22,613.85	Bond interest unpaid for year.....	\$ 5,574.77

Interest paid for the year on bonds issued:	
From net revenue as above.....	\$ 40,962.91
" payments by C. & G. T. & G.T.R. Co.'s as above.....	39,912.38
\$ 6,836.15	\$ 80,875.23
= 3.692% for the year.	= 4.677% for the year.

1899.	1898.
Number of passengers carried.....	71,252
" tons of freight carried.....	240,995
Passenger train mileage.....	69,717
Freight ".....	39,504
Total train miles earning revenue.....	109,221
Piloting, shunting, & light running traffic engine miles.....	82,026
Total traffic engine miles.....	191,247
Passenger car mileage.....	230,986
Freight ".....	990,195
Total car mileage.....	1,220,781

BALANCE SHEET AT DEC. 31, 1899.

Cost of line & rolling stock at Dec. 31, 1898.....	\$3,229,710.45
Deduct amount received from Western Union Telegraph Co. for telegraph wires, poles, etc., on line.....	2,500.00
	<u>\$3,227,210.45</u>
Balance carried down.....	1,789.55
	<u>\$3,229,000.00</u>
Capital stock, 15,000 shares of \$100 each.....	\$1,500,000.00
First mortgage bonds issued, due Jan. 1, 1920, secured by mortgage dated Jan. 1, 1890, for \$2,000,000 interest 5% per annum, payable Jan. 1 & July 1.....	1,729,000.00
	<u>\$3,229,000.00</u>
To balance of capital unspent, brought down.....	\$ 1,789.55
" Bond interest unearned & unpaid.....	122,577.57
" C. & G.T.R. Co., for supplies, for which bonds are pledged, per contra.....	32,000.00
" C. & G.T.R. Co., for advances under traffic agreement.....	157,827.99
" G.T.R. Co. for ditto.....	82,137.28
	<u>\$ 396,332.39</u>
By balance of net revenue account (deficiency per contra).....	\$ 122,577.57
" this Co.'s bonds pledged, per contra.....	32,000.00
" G.T.R. Co.....	1,789.55
" C. & G.T.R. Co., for bond interest coupons pledged as security for advances under traffic agreement.....	157,827.99
" G.T.R. Co. for ditto.....	82,137.28
	<u>\$ 396,332.39</u>

Alberta Railway & Coal Company.

The accounts for the year ended June 30 last, show that the coal sales made by the Co. during the year were 160,645 tons, against 184,764 during the previous year, a decrease of 24,119 tons, attributable entirely to smaller sales in Montana. On the other hand, the earnings of the railway, apart from the carriage of the Co.'s coal, increased \$42,393, the gross returns being \$119,139, against \$76,746 for the preceding year. After payment of interest on prior lien debenture stock there remained a balance of profit of £4,628, which, added to the balance of £42 from last year's accounts, amounted in all to £4,670. The auditors having certified this amount as payable to the A debenture stockholders, a distribution of £1 17s.%, requiring £4,625, has been made amongst them. Since June 30 last the Co.'s business has expanded, particularly in the case of its railway traffic. The Co. is now regularly transporting large quantities of Crow's Nest coke over its entire system for use in the smelters in Montana.

The accounts of the allied company, the Canadian Northwest Irrigation Co., for the year ended June 30th, show that the land sales during the year were 27,484 acres, & since June 30 last further sales have been made of 1,545 acres, or a total of 29,029 acres, for which good prices have been obtained. All this land is outside the irrigation area, so that none of the irrigated & more valuable land has yet been sold. The construction of the

Company's irrigation canal system was completed, & water running through its entire length on Sept. 4 last. The total length of the system is 115 miles.

Special Meeting of the G.T.R. Company.

A special general meeting of proprietors was held at the Cannon Street Hotel, London, Eng., Dec. 12. The notice calling the meeting said:—"The proprietors have been informed in recent half-yearly reports, that the Chicago & G. T. Co. was in process of reorganization, & the directors have to report that the sale of the C. & G. T. line & property, under decree of foreclosure, took place on Oct. 31st last, & was acquired by the purchasing committee appointed for that purpose. A new Co. has since been incorporated under the title of the Grand Trunk Western Ry. Co., with a capital of \$6,000,000 of common stock, \$15,000,000 of 1st mortgage 4% 50-year gold bonds, & \$1,500,000 of 4% income bonds secured by a 2nd mortgage on the property. The G. T. Co. will receive the entire \$6,000,000 of capital stock of the G. T. W. Ry. Co., in consideration of which the agreement, copy of which is appended hereto, will be entered into. Under this agreement the Co. will guarantee the interest on the \$15,000,000 1st mortgage bonds. Although the terms of the agreement are within the powers already granted by the proprietors at the ordinary general meeting, held on Oct. 9th last, the directors deem it desirable that the arrangement as now finally concluded should be formally confirmed. A resolution to that effect will be accordingly submitted at the special general meeting, which the directors recommend for acceptance by the proprietors."

The President, Sir C. Rivers Wilson, said they would remember that the C. & G.T. line

was created some 20 years ago, & that by an agreement in 1880, the G.T.R. undertook to make up the interest of 6% on the 1st mortgage bonds amounting to \$6,000,000, & in 1882 a further mortgage was made, & a further agreement was entered into by the G.T. for guaranteeing—still out of the gross traffic interchanged—a further mortgage of \$6,000,000. The line had proved during the course of those years to be unequal to meet its obligations, & the consequence had been that a very heavy charge had been thrown year by year upon the G. T. guaranteeing company. By singular want of foresight no provision was made in the agreement of 1882, by which any money could be obtained for capital purposes—that is to say, for the betterment or the improvement of the line. The consequence had been that all the burden of improvement had devolved upon the G. T. Co. The amount that it had advanced for capital purposes at present came to no less than £1,359,000. When the 1st mortgage bonds fell due on Jan. 1, 1900, no means were provided for the payment off of that mortgage, & the G.T., as largely interested in the C. & G.T. Co., took the initiative in considering what steps should be taken to deal with the property. It was quite clear that it was not an obligation, either legal or moral, for it to meet this liability, which fell due on Jan. 1 last. Still less could they contemplate the possibility of a continuance of this heavy drain, year by year, upon the resources of the G.T. Co. The view they took was that there must be a complete reorganization of the capital of the Co., having for its object that the Co. in the future should stand upon its own legs, & should not be entirely dependent, as it had been heretofore, upon the G. T. Co. Shortly after the bonds became due & were defaulted upon steps were taken for the foreclosure of the mortgage, & trustees were ap-

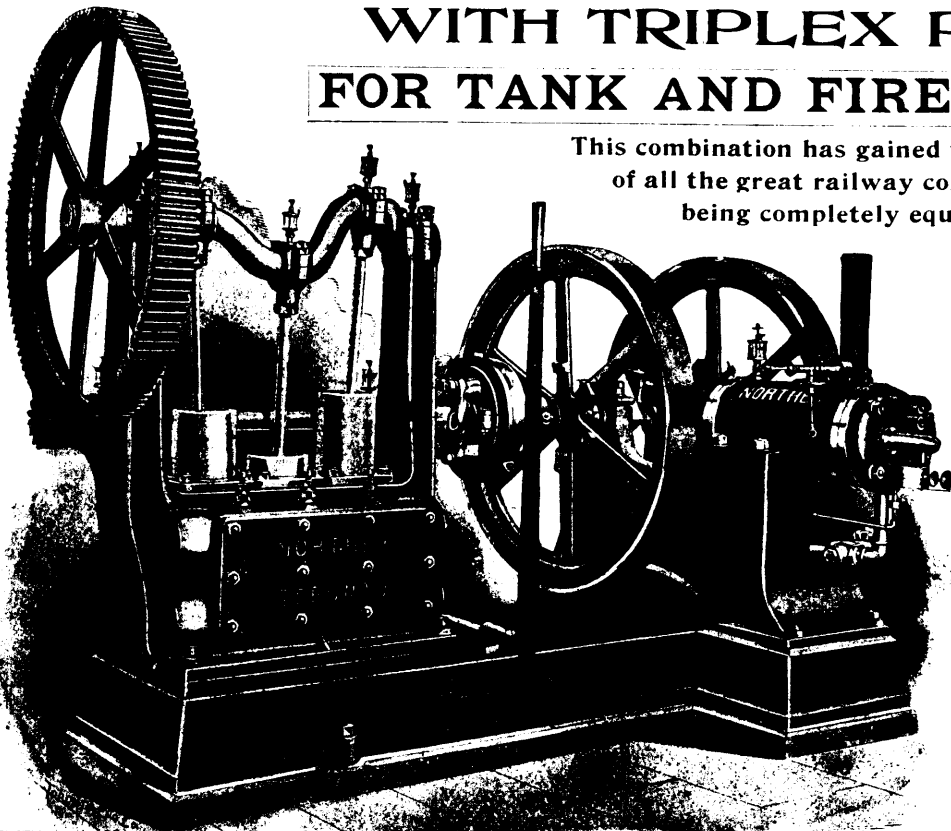
pointed, in the interests of the bondholders, to make the necessary arrangements. As representing the large majority of the bondholders, they had met in council the representatives of the 1st mortgage bondholders, who were more particularly interested, inasmuch as their mortgage would, under ordinary circumstances, have run on for a period of another 22 years. They came to an agreement with them, & the result of the agreement was that a new company had been formed, which was constituted upon the basis of a mortgage debt of \$15,000,000 of 1st mortgage, carrying interest at 4%. They undertook, as the result of their negotiations with these bondholders, that the G.T. should undertake to guarantee that it would set aside 30% of its gross earnings from the interchange of traffic to meet the interest upon those bonds amounting to \$600,000 a year, & furthermore, they agreed to give an unconditional guarantee, although the board considered that a traffic guarantee virtually answered all purposes. Since then the line had been sold, the old company had disappeared, & a new company, which would be called the Grand Trunk Western Co., had come into existence. Then, for the purposes of administration, it was thought advantageous that the G. T. Junction Co. should lease itself in perpetuity to the G. T. Co. Much credit was due to Mr. Hays & his legal adviser for the efficient manner in which the whole of the arrangements had been carried out. He concluded by moving that the agreement be approved.

Vice-President Jos. Price seconded the motion, which was agreed to unanimously. The proceedings terminated with a vote of thanks to the President & directors.

Sir Rivers Wilson paid a glowing tribute to C. M. Hays, saying it was impossible to find a second Hays, but he believed G. B. Reeve was the best man whose services could possi-

The NORTHEY GASOLINE ENGINE WITH TRIPLEX PUMP FOR TANK AND FIRE DUTIES.

This combination has gained the heartiest endorsement of all the great railway corporations. Some are being completely equipped with them.



This cut illustrates a very satisfactory combination of the Triplex Power Pump, actuated by The Northey Gas and Gasoline Engine, for duties wherever an independent pumping plant, ready for instant service, is required. The advantages of this plant are: economy in space occupied, low running expenses, extreme ease in handling (any person can operate it), readiness on the minute for service at all hours, making it invaluable in case of fires, and the absolute safety and precision with which it performs its work.

The Triplex Pump used, with pistons placed 120 degrees apart, gives a practically constant flow of water, minimising strain on pump, connections, piping, etc. Both machines are heavily and solidly built, and carry the most ample guarantees.

We will be pleased to send you catalogues and specifications.

The Northey Co., Limited,
Manufacturers of Pumping Machinery of every description.
1032 King St. Subway,
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bly be secured. He dilated on the sacrifice Mr. Reeve had made in giving up his retirement to take on the onerous duties of General Manager.

The shareholders congratulated the directors on the action taken, & gratefully bade farewell to Mr. Hays.

It was announced that Mr. Hays' staff would remain with Mr. Reeve.

C.P.R. Earnings, Expenses, &c.

Gross earnings, working expenses, net profits and increases or decreases over 1899, from Jan. 1, 1900 :

	Earnings.	Expenses.	Net Profits.	Increase or Decrease.
Jan.	\$2,152,071.32	\$1,460,501.71	\$691,569.61	\$74,035.75+
Feb.	1,954,087.59	1,331,355.34	622,732.25	23,030.77+
Mar.	2,294,786.97	1,495,685.73	799,101.24	29,794.33-
Apr.	2,491,194.47	1,464,126.85	1,027,067.62	106,764.13+
May.	2,662,897.81	1,583,227.32	1,079,670.49	46,911.88+
June.	2,612,759.73	1,554,954.11	1,057,805.62	34,745.42+
July.	2,471,169.64	1,486,795.74	884,373.90	88,587.73-
Aug.	2,637,983.61	1,583,508.01	1,054,475.60	35,643.88+
Sept.	2,663,491.82	1,604,791.81	1,058,700.01	88,185.54-
Oct.	2,774,826.60	1,690,652.19	1,078,174.41	332,841.53
Nov.	2,748,660.22	1,683,111.90	1,065,548.32	216,687.56-

\$27,463,929.78 \$17,044,710.71 \$10,419,219.07 \$434,964.86 -
+ Increase. - Decrease.

Approximate earnings for Nov., \$2,667,000, against \$2,941,000 in Nov., 1899, decrease \$274,000.

SUBSIDIARY LINES.

DULUTH, SOUTH SHORE & ATLANTIC.—Approximate earnings for Nov., \$176,123; decrease from Nov., 1899, \$41,766.

HANCOCK & CALUMET.—Approximate earnings for Nov., \$22,726, decrease from Nov., 1899, \$790.

MINERAL RANGE.—Approximate earnings for Nov., \$24,209; decrease from Nov. 1899, \$5,765.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—Approximate earnings for Nov., \$404,086; decrease from Nov., 1899, \$113,016.

Canadian Pacific Railway Land Sales.

	Acres.		Amount.	
	1900	1899	1900	1899
Jan.	31,486	14,718	\$100,857.85	\$46,411.35
Feb.	23,613	13,747	75,771.19	43,371.69
Mar.	31,183	24,045	97,777.79	75,460.76
April.	58,457	36,620	181,775.78	116,835.84
May.	66,057	26,584	214,851.09	88,928.98
June.	57,831	54,225	188,779.64	169,192.74
July.	49,715	47,401	129,481.42	149,546.48
Aug.	32,178	35,214	103,480.78	110,705.50
Sept.	21,807	25,517	69,012.54	83,719.70
Oct.	18,858	30,473	62,799.54	99,429.09
Nov.	22,408	42,633	69,627.27	140,491.39
	404,593	351,183	\$1,294,184.89	\$1,124,093.52

Grand Trunk Earnings, Expenses, &c.

The following statement of earnings, supplied from the Montreal office, includes the G.T. of Canada, & the Detroit, Grand Haven & Milwaukee Rys., the earnings of the Chicago & G.T., which is in the hands of receivers, being omitted :

	1900.	1899.	Increase.	Decrease.
July	\$1,844,458	\$1,799,945	\$44,513	....
Aug.	2,088,602	2,054,269	34,333	....
Sept.	2,117,690	2,178,303	....	60,613
Oct.	2,176,028	2,158,337	17,691	....
Nov.	2,029,891	2,100,214	....	70,323
	\$10,256,669	\$10,301,068	\$86,537	\$130,936

Decrease for 5 months, \$44,399.

The following figures are issued from the London, England, office :

GRAND TRUNK RAILWAY.

Revenue statement for Oct., 1900 :

	1900.	1899.	Increase.	Decrease.
Gross receipts	£227,000	£244,400	£2,600	....
Working expenses	268,500	262,500	6,000	....
Net profit	£18,500	£161,900	....	£34,000

Aggregate from July 1 to Oct. 31, 1900 :

	1900.	1899.	Increase.	Decrease.
Gross receipts	£1,612,200	£1,604,047	£7,553	....
Working expenses	1,029,800	1,012,515	17,285	....
Net profits	£582,400	£592,132	....	£9,732

DETROIT, GRAND HAVEN & MILWAUKEE RY.

Revenue statement for Oct., 1900 :

	1900.	1899.	Increase.	Decrease.
Gross receipts	£20,000	£19,000	£1,000	....
Working expenses	15,000	11,300	3,700	....
Net profit	£5,000	£7,700	....	£2,700

Aggregate from July 1 to Oct. 31, 1900 :

	1900.	1899.	Increase.	Decrease.
Gross receipts	£77,900	£80,304	....	£2,404
Working expenses	59,100	59,311	8,789	....
Net profit	£18,800	£29,993	....	£11,193

TRAFFIC RECEIPTS OF THE SYSTEM.

Traffic receipts, July 1 to Nov. 30, 1900 :

	1900.	1899.	Increase.	Decrease.
Grand Trunk	£2,009,540	£2,017,514	....	£7,974
D., G. H. & M.	98,013	99,144	....	1,131
Total	£2,107,553	£2,116,658	....	£9,105

St. Lawrence Winter Navigation.

J. Kennedy, Chief Engineer of the Montreal Harbor Commission, has made the following report :—“ In answer to the question of the Board as to the advisability of an effort being made to keep the St. Lawrence open all winter at Cap Rouge, & as far above as may be found practicable, by the use of the Government ice-breaking steamer Stanley, I beg to say that I consider it of great importance that such an effort be made. It is, I think, established that the taking of the ice on the main channel of the St. Lawrence between Montreal & the sea, does not occur by the formation of a smooth sheet over its surface, nor by the widening of the border from the sides until the whole is covered as in small rivers, but by the formation of floating fields, which are kept in motion by tide or current, & which grow as they move, until one or more become of sufficient size & strength to block the narrow places of the river, as at Sorel Island, at Cap Rouge, & the Island of Orleans. A blockade thus formed, if allowed to stand, arrests all floating ice which strikes it, the smaller floes are forced under by the tide or current, & there lodge until an ice jam of great thickness & strength is formed, & meanwhile the larger floes accumulate on the surface until the river above is covered. The experience in keeping open the winter ferry at Quebec has shown that by the skilful use of steamers of moderate power at the proper time & place, the formation of such blockades can be prevented, or if suddenly formed they can be broken up before attaining great strength; & that the floating fields, having then nothing to hold them are kept moving by tide & current, & are carried off to sea before attaining sufficient size & thickness to seriously obstruct navigation.

“ The conditions which prevail at Cap Rouge are so nearly the same as those at Quebec that there can be no doubt but that the Cap Rouge ice jam can also be prevented from forming, & with equal ease. In the winter of 1885-6 no blockade formed at Cap Rouge, & the main channel of the river also remained open from Three Rivers to the Gulf, which goes to show that if Cap Rouge be kept free it should not be difficult to keep much more of the river open. It is well known that the Cap Rouge ice jam is the last point of obstruction to the clearing away of the ice above Quebec in spring, & that navigation up to Montreal is sometimes seriously delayed by its holding on to a late date. The average date of the opening of navigation at Montreal by the river steamers which winter above Cap Rouge is, for the last 25 years, April 19, but the average date of the first ar-

rivals from sea is retarded until April 30. Allowing a day for ships to come from Quebec to Montreal leaves 10 days average delay in the opening of navigation from sea, which may be fairly considered as caused by the holding on of the Cap Rouge ice jam.

“ An ice-breaking boat of the power of the Stanley could by occasional work at proper times easily eliminate this delay; by additional work she could keep open all winter the channel up to the lower end of Lake St. Peter; & the same or a more powerful boat, by more constant work, & the skill which would be gained, by experience would not only keep open the navigation channel through to Montreal but, as was pointed out by the Montreal Flood Commission of 1887, it would, by breaking up the ice at proper places and times, prevent the formation of heavy ice jams, & thereby prevent the disastrous winter floods of which they are the primary cause.”

A meeting in reference to winter navigation of the St. Lawrence, held in Quebec recently, was addressed by J. X. Perreault, Canadian Commissioner to the Paris Exhibition, representing Armstrong, Mitchell & Co., the well-known ship-builders; Col. McNaught, one of the directors of the Great Northern Ry. of Canada, Capt. Inman of Duluth, & O. W. Norden, of Finland & Paris. Mr. Perreault had greatly interested himself in the models of ice-breaking vessels built by Armstrong & Co., which were shown at the Exposition, & brought one of the models to Canada with him. Capt. Inman, who has taken a great deal of interest in the subject of winter navigation, said that it struck him as singular that navigation on the St. Lawrence should cease during the winter. He had been conversing with pilots & found that the river was seldom frozen over entirely. He pointed out that winter navigation where ice has to be contended with has been practised in America for 30 years. With a small boat of 250 h.p. he had kept the harbor of Duluth open all winter, although they had ice of from 18 to 36 in. in thickness to deal with. He saw nothing to prevent vessels keeping up regular trips from Duluth to Georgian Bay ports all winter. With the river open from Quebec to the sea, western grain could be exported with the minimum of land carriage.

Mr. Norden has been intimate with the winter navigation of the Baltic for the past 16 years. The work was begun there in a tentative way, but under the encouragement of the various Governments interested it is developing into enormous proportions, which is proof sufficient that from a commercial point of view the enterprise has been profitable. The winter there, he says, is quite as severe as along the St. Lawrence. He considered that winter navigation was practicable here, even more so than on the Baltic, where they did not have the advantages of the tides. As it had been shown that the risk was not considerably larger than by ordinary navigation, he did not believe that insurance rates would be too high to leave any profit in the business.

Col. McNaught said that when the G.N.R. was nearing completion the Co. became interested in the subject of winter navigation. He got in communication with Capt. Inman & other experts. He also had a number of interviews with the Detroit dry-dock people, who have perhaps more experience in winter navigation & in building boats for winter navigation on the great lakes & in other parts of the world than any other company in existence. These gentlemen have no doubt of the practicability of the scheme. Col. McNaught has subjected the matter to the cold analysis of a business calculation. It costs 25% more to build steamers suitable for the work, & 25% more to operate them. But even with these increased expenses water carriage could still underbid carriage by railway. A saving of \$5,000,000 a season could be effected

on the products shipped from Duluth alone. So confident are the Detroit men of the feasibility of the scheme that they have become members of a company formed by Col. McNaught for the purpose of going into the business. If the Federal Government is disposed to assist in establishing the service, the following offer will be made by the company: It will furnish one-half money necessary to build three steamers & three ice-tugs & operate them, if the Government will complete the necessary lighthouses & contribute as a subsidy enough money to cover the additional expense of a winter boat, & enough money in annual subsidies for a few years to pay the additional cost of insurance for winter navigation.

Electricity for motive power on C.P.R.

—A Rossland paper states that General Superintendent Marpole, of the Pacific Division, & W. Cross, Assistant to the Manager Mechanical Dept. Western lines, recently visited there to confer with the West Kootenay Power & Light Co.'s officials, in reference to securing electric power for operating the railway between West Robson & Rossland.

Concrete Stone Arch Culvert on the L. E. & D. R. R.

Owen McKay, Chief Engineer of the Lake Erie & Detroit River Ry., has furnished plans of a concrete arch culvert of 20 ft. span recently constructed over Little Cedar creek, about 29 miles east of Walkerville. The abutment & wing walls of the culvert stand upon a foundation of 4 rows of live oak piles, spaced $2\frac{1}{2} \times 3$ ft., driven to a depth of about 16 ft. & cut off at an elevation 6 ins. above the lower limit of the concrete work. The abutment walls are 10 ft. high, to the springing line, & $5\frac{1}{2}$ ft. thick at that point, sloping off to a point 2 ft. above the foundation on the back side. The arch has a radius of 10 ft. $7\frac{3}{4}$ ins. at the intrados & a radius of 20 ft. at the extrados, & is 2 ft. thick at the crown; the rise of the arch is 7 ft. The spandrel walls are $2\frac{1}{2}$ ft. thick & extend $1\frac{1}{2}$ ft. above the crown of the arch. The arch is 51 ft. long, face to face, & covering a width of 12 ft. each side of its middle there are 10 curved track rails embedded in the concrete of the arch, as shown at A, fig. 1.

The wing walls are 22 ft. long & open out at an angle of 12° . Up to the springing line

of the arch the face of each wing wall stands vertical, thus permitting it to meet the face of the abutment wall at a vertical corner, & avoiding a re-entrant angle, to obstruct the flow. Above the springing line the wing walls are slightly battered & finished without coping at a slope of 1.7 to 1 from the ground line, which is 6 ft. above foundation. The paving of the culvert is a flat inverted arch of concrete, 12 ins. thick on the center line & 20 ins. thick at the abutment walls. The thickness shown on the plans on page 361 is 8 ins. at the center line, but as the work progressed a soft bottom was found, & the plans were not followed in respect to this detail. The paving extends the entire length of the opening between the wing walls, or 95 ft. from end to end, & is curved at either end with a concrete wall 2 ft. thick & $2\frac{1}{2}$ ft. deep. The distance from the crown of the arch to the base of rail is 11 ft. & the clear height of the opening under the arch, on center line, is $14\frac{1}{2}$ ft. Other dimensions appear in the engravings.

All the masonry of the arch & in the supporting & protecting walls is of concrete. The material of which the arch is composed consists of 1 part of Portland cement to 2 parts of clean, sharp sand & 3 parts of crushed

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stone. The concrete in the remainder of the work is composed of 1 part Portland cement to 3 parts of sand & 5 parts of crushed stone. The concrete was hand mixed. The intradas of the arch, the face of the abutments & wing walls, & all exposed faces of the culvert were made with a layer of cement mortar $1\frac{1}{2}$ ins. thick, composed of 1 part of cement to 2 parts of sand. The back or upper surface of the arch & back of the abutment walls were covered with a 1-in. layer of strong cement mortar composed of 1 part Portland cement & 1 part sand. The face mortar was deposited at the same time as the backing, & the whole rammed while fresh so as to ensure a good bond. To protect the back of the arch & abutment walls those surfaces were covered with a layer of asphaltum applied hot. The forms for the concrete were made of 2-in. pine plank dressed on the inner side & both edges. The stone used in the concrete was broken to pass through a 2-in. ring & screened to rejection by a $\frac{1}{4}$ -in. ring.

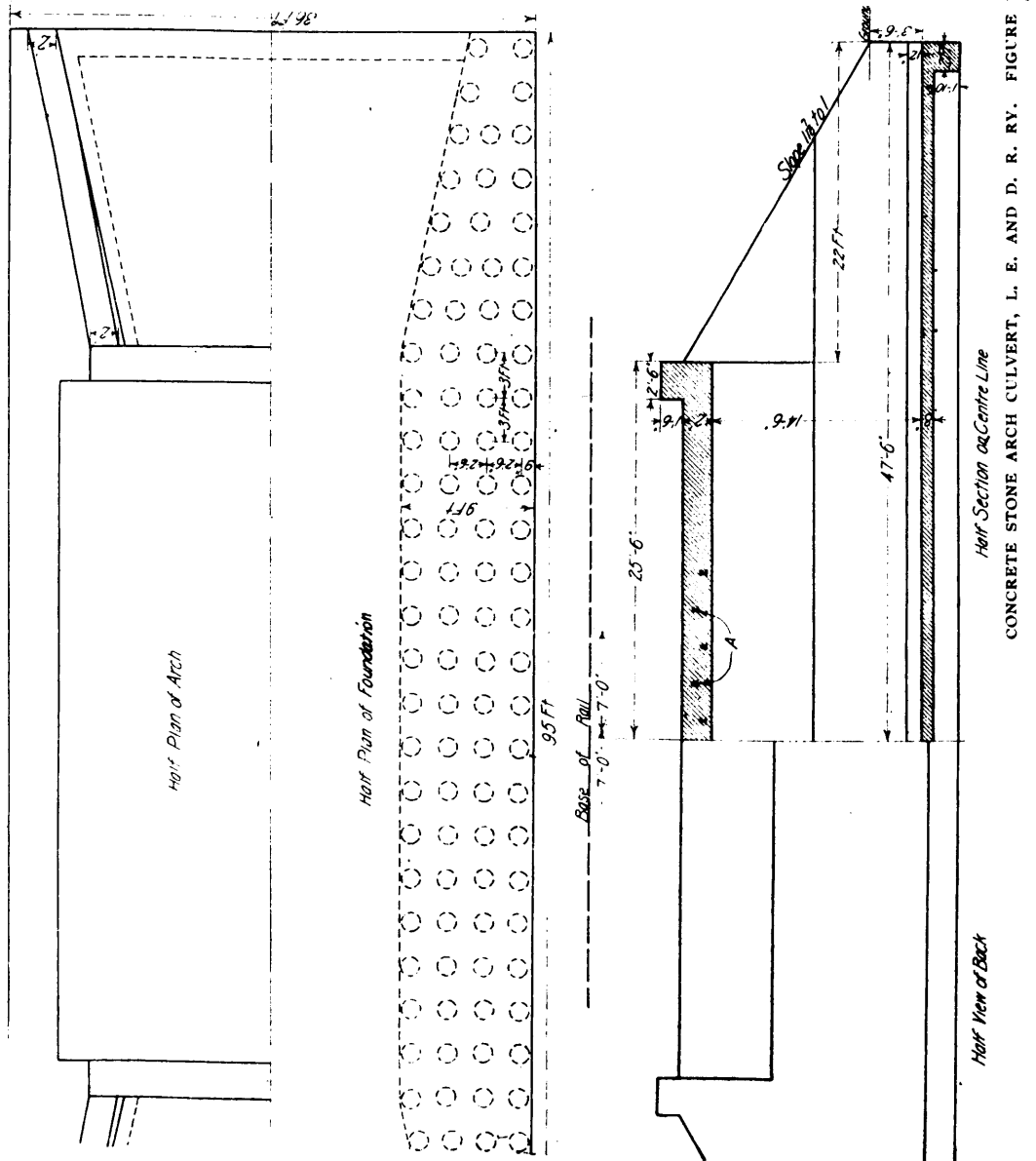
The culvert was constructed under a trestle crossing a ravine, which has subsequently been filled up, requiring about 1,400 carloads of gravel for the embankment. The number of cubic yards of masonry in the structure is 785. The work was done by contract, beginning April 5, & completed Aug. 4. The total cost of the culvert was \$6,700, & for diverting the stream & making the embankment, \$1,385.

local companies, but it will not necessarily be in the form which we submit to you to-day. The auditor of the local companies is the correspondent of the auditors of this company (Woodthorpe, Bevan & Co.), who are people well known in the city of London, & in a great measure it was for this reason that Geo. Wilkinson (the auditor of the local companies) was appointed their auditor by the boards of these companies. You will, naturally, wish to know how matters have been progressing with the railway enterprise during the present season. I can begin by assuring you that, in our opinion, the progress that has been made & the prospects of the undertaking are very satisfactory. You will remember that I told you, when I had the pleasure of addressing you about a year ago, that it had been determined to extend the line from Bennett's City to the foot of the White Horse Rapids, so as to avoid waste of time & money involved in unloading freight from the Upper Yukon steamers on to the tramways & reloading it on the Lower Yukon steamers, & so as to deliver goods at a point whence there is unimpeded navigation for steamboats to Dawson City & the mouth of the Yukon. This

extension—a most important link in our system—as you will have seen from the reports, has now been completed, & since early last Aug. through trains have been running from Skagway to White Horse—a line of $112\frac{1}{4}$ miles. At White Horse the trains connect

White Pass & Yukon Railway.

The third ordinary general meeting was held in London, Eng., Nov. 19. The Hon. S. Carr Glynn, Chairman of the Co., who presided, said: The report & statement of accounts, together with the documents attached to them, have been in your hands now for some time, & I have no doubt they have been perused by you with great interest. They are certainly far more voluminous than is usual on these occasions; but we thought in the present condition of the undertaking you ought to have the fullest information, & it could not be supplied better than by the excellent reports of Mr. Hawkins, our Engineer-in-Chief, & which have been made on the spot. This gentleman has had charge & control of all of the operations that have been carried out, & by these reports you will see how thoroughly well the work has been done in the face of great difficulties, encountered from the severe climate & the disadvantage of carrying out the work at so great a distance from the base. But, in addition to this, I am glad to say that we have with us to-day Mr. Graves, the President of the Yukon route, who has just returned from spending some time on our railway & in its immediate neighborhood, & who will be able to give you complete information at first hand with regard to the prospects & position of your railway, with which he has been so closely connected since the inception of the enterprise. This year we have issued with our report a copy of the report of the auditors of the local companies, because we thought that the shareholders would naturally wish to know that a careful examination of the local companies' accounts had been made, & I think this report gives particulars of the three local companies' accounts combined in much greater detail than is usually the case. We shall publish with our annual report a certificate from the auditor of the



with the steamers of the Canadian Development Co., with which Co. an advantageous through-traffic agreement has been made.

I do not wish to go into great detail, but there are one or two points to which I must allude. I should wish to express our sincere thanks to the Pacific Contract Co. for the excellent manner, as well as the expedition, with which their work has been carried out, as certified by our Chief Engineer, to whom was entrusted by the contractors the arrangement of all details of construction, & the work was carried out under his supervision & to his specification. I should also be neglecting my duty if I did not place on record the high appreciation we feel—and I am sure you will endorse this—for the services of all our staff, & to express our sincere gratitude for the zeal & devotion they have shown, often under circumstances of very great difficulty. I should wish, also, to congratulate the shareholders upon—may I say the undoubted success of the enterprise in which we are interested. The indications that are before us seem clearly to demonstrate that it must result in a great success, both financially & commercially. And it must be a satisfaction to feel that we have opened out a route through what was a wild & inhospitable country, after surmounting almost unparalleled difficulties, to a nearly unknown region, doubtless not favorable to regular settlement, but teeming with mineral wealth of all descriptions, which, when gained, must conduce, if not to the happiness, at any rate to the prosperity of the community. It is equally satisfactory to feel how much this route has mitigated the sufferings & privations that previously had to be undergone by those who sought to traverse these desolate passes & dreary regions, & I am sure you will agree with this—for all Englishmen are fond of horses—that it is also a pleasure to feel that it has spared the lives & reduced the terrible sufferings of many of those noble animals which are man's allies in so many arduous undertakings. Therefore, from many points of view we may regard our enterprise with pride & satisfaction as a monument of scientific progress & engineering skill. I should now like to call your attention to the balance-sheet which is laid before you. You will notice that the accounts of the local companies are brought down to the close of 1899, & our own Co.'s accounts are made to a date six months later. This produces a discrepancy which, possibly, some of you may have remarked, but which is easily explained. In the body of our report the profits are put down as £117,-

411, whereas in the profit & loss account they appear as £125,523. The difference between these figures is due to the fact that a further six months' interest in local companies' bonds is brought into our accounts. I think in all probability when we present another account we shall put these as a separate item, because it is a little confusing. Now, with regard to the debentures you will remark that there are three issues of debentures made by the company, all carrying interest at the rate of 6%. We have successfully arranged to convert these three issues into one consolidated issue of 5% debenture stock, affording us a considerable saving in interest. Holders of £435,000 out of £469,000 of securities actually issued have so far signified their intention of exchanging from the 6% to the 5%. A public issue of this consolidated stock will be made in a few days, &, considering the very large margin of profit in excess of the amount required to pay the interest on the debenture stock, we anticipate it will be well taken up. The bills payable & sundry creditors are bills, etc., on account of the net earnings, & are being repaid out of such earnings as they are received. The balance of profit & loss account is £83,315, sufficient to have paid a satisfactory dividend, but this, in accordance with the sanction of the meeting last year, has been expended in the further construction of the railway.

Turning to the credit side, the shares & debentures & mortgages of the local companies are all held & controlled by the Railway Share Trust & Agency Co., who are the trustees for the debenture-stock holders. The local companies are actually controlled by this Co., & if the management is unsatisfactory to our shareholders we can order a complete change. With regard to the next item, about £28,000 was paid to the contractors on account of the construction of the second portion. The rest has been spent in acquiring further rights & concessions as stated in the balance-sheet entry. The contract price for the construction of the second portion was £6,000 a mile, payable as to £300,000 in debenture stock, & as to the balance in cash out of the net earnings. Of the £300,000 of debenture stock £119,830 had been issued at the date of the balance sheet, & the remainder was issued against engineers' certificates received subsequently to that date. The only other point I think I need remind you of is that the charges in the profit & loss account are for two years less one month, & there will naturally be a considerable reduction in these

items in our next accounts. During last year we published in the English papers particulars of the weekly traffic earnings as they were cabled to us from the other side; but after very careful consideration it was decided that it was not desirable, in the interests of the shareholders or of the public, to continue the practice this year, because any such publication must of necessity be misleading. For one thing, the contractors had an interest under their contract in the net earnings of the second portion of the line until it was completed & accepted from them on behalf of the local companies, &, consequently, the weekly earnings that could be published would not give a fair indication of the benefit that their company would derive from such earnings. And another thing, our railway is peculiarly circumstanced. The earnings during the months of open navigation on the Yukon are very large compared with those for the period during which navigation is closed, & to publish the traffic during the busy months would, to the uninitiated, give a totally false impression of the earning capacity of the enterprise for the whole year, & any one buying shares in ignorance of the fact that the traffic returns drop off almost entirely during the winter months might well have cause to complain of not being warned. It is proposed also during the winter months to overhaul & revise the traffic rates in time for the heavy work that we anticipate in the summer. When the railway has run for some little time, & it becomes a well-known fact that the traffic returns for the very few busy months in the summer are not to be taken as an average for the whole year, we may revert by publishing the traffic returns. I am glad to say that the earnings have been very satisfactory, & I will go further, & say that I believe that when the accounts of the local companies come to be made up at the end of the year, it will be found that the net earnings of this year, after deducting all charges for operating & maintenance, have exceeded £200,000. It must not be supposed, however, that this amount is now available for dividends; for the net profit of last year & practically all the surplus cash collected this year have been applied in acquiring further concessions & properties tending to the consolidation of the enterprise & in payment for the construction of the second portion of the line.

A considerable amount out of the earnings of this year may not be collected until next spring; for the earnings on through freight are not collected until the consignees at Daw-

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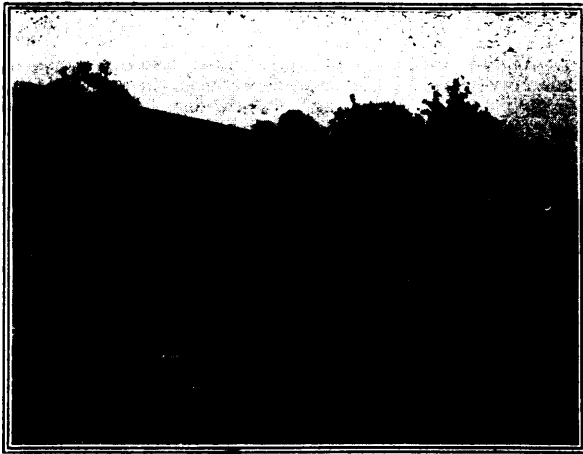
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SIDE VIEW OF CULVERT AND WINGWALLS, L. E. AND D. R. RY.
FIGURE 2.

son & elsewhere take delivery of the goods. Thus, at the present moment, there is not the cash in hand to pay an interim dividend, but it is hoped, when all the earnings have been converted into cash, that it may be found possible to pay a dividend of, perhaps, 5% this winter or early next spring. From now on, however, unless anything very unforeseen occurs, the net income should be available for dividends & reserves, for unless conditions in the Yukon change very rapidly there is no present intention of extending the railway beyond White Horse. Some of the shareholders may consider the policy of applying the profits of the Co. to capital expenditure as open to criticism, but my colleagues & myself, & many of the principal shareholders who had been consulted, considered that the best interests of the Co. demanded the immediate extension of the railway & the consolidation of the enterprise, even though it absorb profits available for distribution, & had we attempted to finance the extension of the second portion of the railway by issuing more shares or debentures, it would have proved a very heavy burden for this Co. to support in the future. I feel that in these remarks I have dealt more with generalities than details; but I know Mr. Graves will supply any omission on my part, & you will also find, as I stated before, details on almost every point in these reports. I shall conclude by quoting the final remarks made by Mr. Hawkins, which seem to me most appropriate: "The prospects for future business are even better than at the time of making my report upon the conditions of the first section. With every confidence in the future success of this quite remarkable railway enterprise, I remain, &c." I think we may, with every confidence, re-echo these words and share these sentiments. I beg to move:—"That the report & accounts submitted to the meeting be received & adopted."

Sir Allen Sarle seconded the motion.

S. H. Graves said: The Engineer's report, which is already in your hands, describes the construction of the first & second sections of the railway, & the difficulties attending it, & the nature of the line as constructed, & the report of the auditor of the local companies, also in your hands, shows the result of the operations of the line from the date it was opened, in July, 1899, down to the end of last year—a period slightly under six months. During the winter season, while navigation on the Yukon is closed, the traffic is very light; while, on the other hand, the operating expenses are very heavy, in consequence of the expense involved in keeping the line free from snow & ice. Last winter we were particularly unfortunate in this respect, in consequence of the repeated breakdown of our rotary snow plough, caused partly by the very heavy

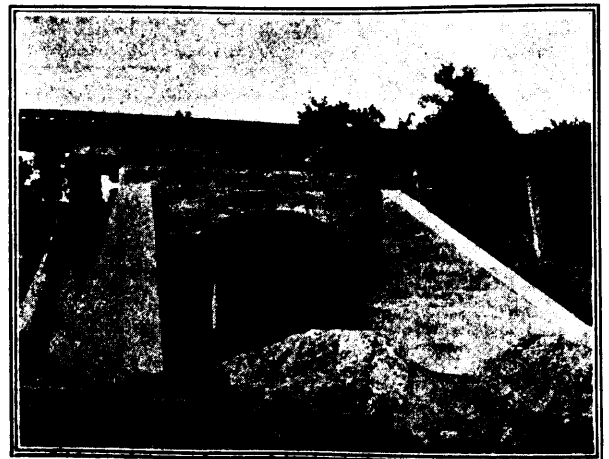
nature of the service, & partly by hidden flaws in the steel & iron work. This plough has now been practically rebuilt in our own shops at Skagway, & is very much stronger in every way than when it was delivered to us by the builders, & a second plough, specially designed for our service, has been built for us, & I presume, by this time has reached Skagway, as it was on its way when I last heard of it. I anticipate that the traffic this winter will be heavier than last winter, now that our line is open as far as White Horse. During last winter the construction of the second section of our railway from Bennett to White Horse was pushed so energetically that it was possible to open the line between Caribou & White Horse, a distance of some 45 miles, on June 8 last. This left

a gap of some 27 miles of very heavy rock-work along the shore of Lake Bennett still to be completed. This gap was closed & the through line opened for traffic on July 30. During the interval before the gap was closed, goods & passengers were forwarded by ferry boat down Lake Bennett. The traffic this season, both freight & passenger, shows, as was anticipated, a marked increase over last year, & I have no doubt that when the figures of the local companies to the end of the year come to be made up they will make a showing which will be entirely satisfactory to the shareholders.

Arrangements were made this year before the opening of navigation, under which we have secured the practical control of the river & lake navigation. The boats, steam tramway, wharves, & other property formerly belonging to the John Irving Navigation Co., by means of which the traffic for Taku Arm & the Atlin district was carried forward from our railway, have passed into our hands, so that this traffic has this season been carried on entirely by our own boats. In view of the quartz development in these districts, I consider it of very great importance for the railway to have secured this line of boats. The Dawson traffic has been carried on this season mainly by means of the boats of the Canadian Development Co., with which Co. we entered into an advantageous through-traffic agreement, under which we participate in the profits of the river boats, & practically control the traffic just as much as if we owned the boats ourselves. This is of great importance, & enables us to deal directly with shippers & consignees. In short, instead of being, as formerly, merely a link in a chain, we have now become the chain itself. You will be glad to learn that in consequence of the improved service which we were enabled to give by controlling the river & lake boats, we are now securing the larger part of the gold shipments which hitherto have been made by St. Michaels. We have also been able to build up a surprisingly large traffic in perishable freight, such as fruit, vegetables, fresh meats, &c., & I expect that this class of traffic will greatly increase in succeeding years. You will, perhaps, be surprised when I tell you that goods shipped from such places as Victoria, Vancouver or Seattle have been throughout the past summer delivered by us in Dawson

along with the mail advising the shipment of the goods. In other words, we have carried the freight as fast as the mail, & both have reached Dawson in about a week from the starting point. The sea voyage of 1,000 miles consumes about four days, & Customs house formalities about another day; so that only two days are left for the carriage of the goods more than 100 miles by railway & 500 miles by river. I spent a large part of last summer on the Pacific Coast & in Alaska & the Yukon territory, & I think you will perhaps like to hear from me some of the results of my personal observations. Dealing first with the railway itself, you have such a full report from the Engineer that I will not enlarge upon it beyond saying that the entire line from Skagway to White Horse is a very fine piece of work. The gradients & alignment show skilful engineering, & will enable the maximum of traffic to be handled with the minimum of expense & delay. The wharves, yards, & terminal facilities at Skagway, Bennett, Caribou Crossing & White Horse are of the latest & most approved design, & admirably adapted for our work. The road-bed, though new, is better than that of many older roads. Our shops at Skagway are equipped with iron & brass foundries, a steam hammer, pneumatic-air tools; & in short, all the requisites of an up-to-date locomotive & car-building plant, & we now build our own locomotives out of materials purchased from engineering companies, & our cars out of raw material. The rolling stock is all first-class of its kind.

The large coal storage bunkers at Skagway, with a capacity of 3,500 tons, which were built this summer to enable us to carry a winter supply of coal, are now filled, & we are ready for the winter so far as fuel is concerned, instead of having to depend, as last winter, upon getting cargoes during the rough winter months. The steel cantilever bridge across Switchback Canyon was in process of erection when I was there, & I trust that by this time it is about ready for use, thus saving the delay & expense already involved by the operation of the switchback. Our operating department estimates that this bridge will pay for itself in two years. We are putting in steam travelling gear for loading & unloading vessels by machinery at our wharf at Skagway, & in this way we shall for the future effect a great saving in time, labor & expense. You will gather from the foregoing that by the time business is resumed next spring, with the opening of navigation, we shall be in a position to handle a very large traffic to the best possible advantage. The next thing that you will want to know is as to the prospects for such a traffic. Hitherto by far the greater proportion of the business go-



END VIEW OF CULVERT AND WINGWALLS, L. E. AND D. R. RY.
FIGURE 3.

ing over our line has been for Dawson. The development of other placer mining districts on the Yukon River has been retarded by the Cape Nome rush; but most of the people have now returned from that district, & many of them are going to work during the winter at points along the Yukon River on both sides of the International Boundary. A large business may reasonably be expected for these districts in the future, & already the U.S. Government & the large trading companies are sending in supplies in considerable quantities over our line. As regards the Dawson traffic, the prospects for next season indicate a considerable increase, on account of the Canadian Government having recently adopted the policy of throwing open all claims in the Klondike for mining instead of keeping more than half of them idle as reserved Crown claims. There are also prospects held out that the 10% royalty will be materially reduced, which will enable a number of claims to be worked that are now lying idle, & the Dominion Government have also undertaken the work of making good wagon roads connecting Dawson with various creeks where the gold is produced. Heretofore, except during winter time, traffic has practically been limited to pack horses. But although this Klondike traffic will undoubtedly for many years to come form a large & important branch of our business, it is a great & too common mistake to suppose that the mining industry of the Yukon Valley is limited to Dawson & the Klondike. The development of the enormous valley that is drained by the Yukon River & its tributaries, which form continuous waterways many thousand miles in length, has only just begun; but gold & other minerals are found from the upper sources of the Yukon down, not only to the mouth of the river, but even as far beyond it as Cape Nome. Gold is now being

produced in very considerable quantities at places as widely separated as Atlin, the Big Salmon River, the Stewart River, White River, Forty-Mile River, Tanana River, Koyukuk River & Cape Nome.

The gold is found not only in the gravel beds of the innumerable rivers & streams, but also in quartz veins which are being opened up in many places, especially on the Upper Yukon. In this respect most progress has probably been made in the Atlin & the Taku Arm districts. While I was there this summer I personally investigated a number of very promising quartz veins, some of which were being worked, while work on others was only temporarily deferred by litigation as to title. The veins run from 3 ft. or 4 ft. wide up to as much as 75 ft. wide, which is the width of the vein of the Engineer's Mine on Taku Arm, & the ore shows assay values ranging from \$30 a ton upwards. Besides these more valuable ores, there is an immense quantity of low-grade ore, all of which will ultimately be worked as wages & the cost of living decrease. It is not merely gold ore which is found throughout the enormous territory which is tributary to our railway; but, as before stated, nearly every known mineral, especially copper. The copper discoveries at White Horse, the terminus of our railway, extend at present over an area upwards of 15 miles long & 4 miles wide. Throughout this belt a considerable amount of development work has already been done, & a large quantity of ore is ready to ship as soon as the Government makes the promised wagon-road connecting the mines with our railroad. Much of the ore is sufficiently rich to pay for the cost of shipment to the smelters at Tacoma & other Pacific coast points, & as soon as a sufficient business of this nature develops we intend to run a spur line of 5 or 6 miles in length, connecting our railway with these

White Horse mines. Competent judges who have carefully examined these mines are of opinion that they are destined to rank amongst the largest copper-producers in the world, & that the traffic from this source would alone be sufficient to keep a railway busy in the future. Valuable copper ore has also been discovered in several places in the Atlin district, & of course, copper has long been known to exist in the Copper River, & numerous other places throughout the Yukon Valley. Coal has been opened up near Dawson & at Rink Rapids, & discovered, but not opened up, at a point on our line of survey about 50 miles north of White Horse. This morning I received an account of the discovery of coal, which possibly is more important than any of them. Within 10 miles of our railway, & south of White Horse, coal is said to exist in three distinct veins, one of which is 13 ft. & another 6 ft. thick. I need not say that if that discovery turns out to be as reported it will be an important factor to our railway in reducing the cost of our fuel. In view of the immense importance to our railway of the developments of the quartz-mining industry throughout the Yukon Valley, I gave particular personal attention to this matter last summer; & I can only say that if anybody doubts the permanence of this great valley as a mining country, he has only to take a trip to White Horse, Atlin, & Taku Arm, & see for himself. The country is as yet in its infancy; but already enough can be seen to warrant the confident anticipation that before many years the production of gold & copper ore throughout the territory tributary to our railway will equal that of any country in the world.

The resolution was carried unanimously.

Hon. S. Carr Glynn & W. B. Close were re-elected directors. The other directors are Sir Allen Sarle, director of the London, Brighton, & South Coast Ry., E. Hanson,

Lubricating Oils

**MARINE VALVE, RENOWN ENGINE,
ELDORADO ENGINE OILS and
ARCTIC CUP GREASE.**

Durability—Reliability—Uniformity

Are points of excellence in favor of these oils and greases, which have stood the severest test for years.

These brands with a full line of oils manufactured by the **Imperial Oil Company**

FOR SALE AT ALL LAKE PORTS.

The best goods are most economical. The names of the best are well known to all marine engineers of experience.

A Popular Route to New York



Canadian Pacific, and Toronto, Hamilton and Buffalo Railways in connection with the **New York Central & Hudson River Railroad.** ◆◆◆◆◆

Leaving Toronto in the evening at 5.20 p.m. in one of the through sleeping cars of the Wagoner Co., you are landed at Grand Central station, in the very heart of the City of New York, 4th Avenue and 42nd Street, at 8.15 next morning, adjacent to all hotels and business houses and avoiding the annoyance of transfer.

This is also the route of the famous **"EMPIRE STATE EXPRESS"**

Fastest Train in the world.

Call on nearest ticket agent of the C.P.R. or T.H. & B. for further information, or address

GEORGE H. DANIELS,

Genl. Passr. Agent, Grand Central Station,
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All kinds of... Limited.
**PRINTING, BOOKBINDING,
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Montreal, & J. Price, Vice-President of the G.T.R.

An extraordinary general meeting was then held, at which, on the motion of the Chairman, additions were made to the articles of association to give power to the directors for the conversion of shares into stock.

ISSUE OF MORTGAGE DEBENTURE STOCK.

The Co. recently issued £750,000 5% consolidated 1st mortgage debenture stock, repayable at par on Dec. 31, 1930, but redeemable at 110 by the Co. at any time after Dec. 31, 1920, on giving 6 months' notice & in case of voluntary liquidation.

Following are extracts from the prospectus: The issue has been created to convert into one security all the existing securities of the Co., to provide cash to pay for the second portion of the railway, & for the capital purposes of the Co., & for the purpose of providing that the annual interest payable on the fixed charges shall be at the rate of 5%. The debenture stocks & debentures at present issued are as follows:—

First portion 6% debenture stock.....	£250,000
Second portion 6% debenture stock (part of an authorized issue of £300,000).....	119,830
Second mortgage 6% debentures.....	100,000
	£469,830

Under the trust deeds securing the 1st & 2nd portion debenture stocks the Co. has the right of redemption at £110 for each £100 issued. Notice of redemption has been given, & the existing securities not exchanged under this scheme will be paid off on June 30, 1901. The holders of any part of the existing debenture stocks & debentures may apply for, & will receive, a preferential allotment of £110 of the consolidated 1st mortgage debenture stock in exchange for every £100 of the existing securities held by them. Holders of £431,706 out of the £469,830 existing securities, including the holders of all the 2nd debentures above mentioned, have already agreed to take stock of this issue in exchange for their present holdings. An amount of £474,316 of new stock will be required to be issued in exchange for the old securities that are being converted, thus leaving £275,684 to which subscriptions are now invited.

The railway from Skagway to White Horse is 112¼ miles in length, & the consolidated 1st mortgage debenture stock will be secured as a 1st mortgage upon £752,073 bonds of the local companies owning the railway, & such bonds which will constitute specific 1st charges on the railway from Skagway to White Horse will be vested together with the whole of the capital stock & shares of the local companies in the Railway Share Trust & Agency Co., Ltd., as trustees for the holders of the consolidated 1st mortgage debenture stock.

This Co. was formed in 1898 to carry out & develop certain charter rights & concessions for (inter alia) the construction & equipment of a railway extending about 325 miles from Skagway Harbor, at the head of the Lynn Canal, an inlet of the Pacific Ocean, to Fort Selkirk, on the Yukon River. The charter rights & concessions under which the White Pass & Yukon Ry. has been constructed, are vested in three local companies. These companies & their issued capital stock & shares & their bonds, to be specifically charged upon the sections of the railway owned by them respectively, & deposited in the names of the trustees, are:

	Capital stock & shares issued.	Bonds.
The Pacific & Arctic Ry. & Navigation Co., incorporated under the laws of the State of West Virginia, U.S.A.	£200,185	£100,073
The British Columbia Yukon Ry. Co., incorporated by the Legislature of British Columbia	200,185	227,500
The British Yukon Ry. Co., incorporated by the Dominion Parliament	300,000	355,500
	£700,370	£752,073

The 1st portion of the railway, about 41 miles, from Skagway over the White Pass to Bennett, the head waters of Yukon navigation, was completed & opened for traffic on July 6, 1899; & the 2nd portion, about 71¼ miles, which extends from Bennett to White Horse on the Lewes River, below the White Horse Rapids, was completed & opened for traffic over its entire length early in Aug. this year. At White Horse direct connection is made with the steamers of the Canadian Development Co., with which Co. an advantageous through traffic agreement has been entered into, so that during the season of navigation passengers & freight from Victoria, Vancouver or Seattle can reach Dawson City in about a week, or from Skagway in about 3 days. With these facilities it is not at present considered necessary to extend the railway.

From the date of the opening of the 1st portion of the railway in July, 1899, up to Dec. 31, 1899, a period of about 6 months, the net earnings amounted to \$569,445, equivalent at the rate of \$4.85 per £ to £117,411. The whole length of 112¼ miles was opened for traffic last Aug., & the net earnings for the current year to date amount to over £200,000. The above earnings include no charge for construction material which was carried free. The annual interest on the consolidated debenture stock will be £37,500.

Farewells to C. M. Hays.

On Dec. 17 C. M. Hays, the retiring General Manager of the G.T.R., was entertained by the Montreal Board of Trade at a farewell dinner at the Windsor Hotel, over 200 prominent business men & others being present. President R. Mackay occupied the chair.

In responding to the toast of his health, Mr. Hays said that he appreciated more than he could tell the evidence of their good-will. The period of his residence in Canada had been one fraught with affairs of much moment to the G.T.R., they had occupied him so constantly, he had been away from home so much, & when he had been at headquarters they were so remote from the business centre of the city that he had not had the opportunity he could have wished for closer social relationship with the business men. Now, when he seemed to be approaching a time when more leisure afforded itself, & when removal from the old headquarters brought him into closer contact with them, he was to say good-bye. But, perhaps, after all, our best impressions, our clearest ideas of those with whom we associated, were formed, not in our social relations, but in our business intercourse, & in that respect, he considered himself most fortunate, so far as his relations with the Canadian public were concerned. He had made many friendships, which he hoped would continue for the rest of his life. As to Canadian business men, he had formed a regard for their sterling merit, for their reasonableness & law-abiding qualities that he should continue to remember long after leaving here. He should have none but the most pleasant recollections of his business intercourse with the people of Montreal, & it would be long before he should ever cease to feel the deepest interest in anything that affected the welfare of Canada, her commerce & her railways. He expressed the hope that the Dominion would continue to be prosperous, & said that if, in his new field of labor, he could in any way knit more closely the bonds of friendship which existed between Canada & the U.S., his utmost endeavor would be in that direction. He thanked them for their extreme kindness to him, & as Canadians were proverbially travellers, he hoped to see many of those present on the Pacific Coast, & he should take it as a personal grievance if when there they did not give him the opportunity to take them by the hand &

help him to renew his interest in the kind friends he had left behind in Canada. He concluded by wishing his Montreal friends long life & prosperity.

Hon. S. Fisher, Minister of Agriculture, in the course of his reply for the Dominion Parliament, said he was not prepared to say what would be done with regard to making Montreal a free port, but the harbor improvements commenced by the present Minister of Public Works would be vigorously prosecuted until Montreal was made the best Atlantic port on the continent of America. Transportation interests had largely occupied the time & attention of the last Parliament, as it must also of the next. We had to-day the great railways of the country connecting more than ever before the great inland seas with the port of Montreal, & the rates of transportation had been largely reduced on these railways by good management, such as Mr. Hays had applied to the G.T.R., & by the improvement in the track & in the rolling stock of these corporations. There was still, however, a great obstacle which must be removed before Montreal could stand on equal footing with other ports. The channel of the St. Lawrence must be improved. This was imperative. He had had an experience last summer in connection with the shipment of hay to South Africa which had opened his eyes to the present disabilities of the route. High rates of insurance so militated against the St. Lawrence route that the Government had found that it was very much cheaper to ship the hay to Cape Town from St. John or Halifax, so much cheaper in fact that the difference in the cost of shipment from, say St. John & Cape Town, & Montreal & Cape Town, would pay the freight charges out to the Cape. The farmers of the land were deeply interested in this transportation problem. The new Parliament would need to give its closest attention to their solution.

The Minister of Railways, Hon. A. G. Blair, in responding to the toast of the railway interests, paid a very warm tribute to Mr. Hays. He felt nothing but respect & admiration for Mr. Hays, whom he regarded as one of the great railway captains of the day. He remembered Mr. Hays' regime with especial pleasure, for it was during that period that the Intercolonial was extended into Montreal. He took a peculiar pleasure in recalling this fact because he believed that there was now no question of the wisdom of that step. It had now, he believed, passed from the controversial stage. It was an act, he was convinced, which would redound to the welfare of Canada. It was eminently a business arrangement. When he approached Mr. Hays to do business with him, he had found him a man ready & willing to listen to reason. The arrangement which the Government had entered into was one of mutual advantage to the G.T.R. as also to the I.C.R. Canada was to-day reaping the beneficent results of this policy. While for years the I.C.R. had been in a backward state, it was now running into a great city, & its business had immensely increased. Within a few years the great interests of the West would be dependent, not on one railway system, but on a dozen. Many other roads would be built in the near future. Some people said that the Government should stop the aid which it gave to Canadian railways. If this were done, he believed it would result in staying the progress of this great Dominion. The I.C.R. was not going to stop as a railway in the city of Montreal. Why not have it connected with Sault St. Marie on one hand & Cape Breton on the other. The I.C.R. was now entering on a period of growth greater than was ever dreamed of. We are told that we have the right, that it is our heritage to transport the products of the West, not our products alone from the West to the sea. Why should we therefore not enter upon the promotion of schemes which

shall guarantee our right to handle these products? Between our railways & canals we may well look forward with confidence to the time when our hopes along these lines may be realized. There ought to be a grand future for Montreal. The Government was alive to the importance of this transportation problem. Advancement was the order of the day. Canadians hardly yet knew how great a country was theirs.

G. B. Reeve, General Manager-elect, also responded. He said that previous speakers had covered the ground so thoroughly that there was very little further to say in the way of eulogizing Mr. Hays. Every change & removal which Mr. Hays had made during his administration had cut him to the heart. Mr. Hays had found the G.T.R. on the very verge of bankruptcy. Since he had taken hold he had raised the value of its securities to the extent of \$80,000,000. On Mr. Hays' arrival, G.T.R. securities were looked upon with great suspicion & the road was in anything but a satisfactory condition. He was sorry that the British Government had not seen fit to show Mr. Hays some mark of appreciation. He understood, however, that this was Mr. Hays' own fault, & that he could have had such an honor had he chosen to qualify. Instead of bidding good-bye to Sir Chas. M. Hays, therefore, he said farewell to plain C. M. Hays.

C. Drinkwater, Secretary & Assistant to the President of the C.P.R., also spoke appreciatively of Mr. Hays' work.

"THE OFFICIAL FAMILY."

A few days later Mr. Hays was again entertained at dinner at the Windsor Hotel, Montreal, on this occasion by the chief officials of the Grand Trunk Ry. system & of the Central Vermont Ry. George B. Reeve occupied the chair, & proposed the toast of the evening—"Our Guest"—in well-chosen & happy remarks, which were replied to feelingly by Mr. Hays. The speeches were of an informal description, the dinner partaking of the character of a family gathering. There were interchanges of happy thought, & many references to the high esteem in which Mr. Hays was held by all, & the general regret occasioned by his severing his connections with the G.T.R. Regrets were received from Governor Smith, President of the Central Vermont, for his inability to be present, having left for a winter's sojourn in Italy. The following were present: A. E. Beckett, Montreal; G. T. Bell, Montreal; J. Bell, Belleville; D.

Brown, Chicago; J. Bryce, Montreal; A. Butze, Montreal; C. Clarke, Detroit; W. Cotter, Detroit; S. W. Cummings, St. Albans; J. J. Cunningham, Montreal; J. E. Dalrymple, St. Albans; W. E. Davis, Montreal; C. E. Dewey, Stratford; M. C. Dickson, Toronto; F. W. Egan, Toronto; H. G. Elliott, Montreal; L. J. Ferritor, St. Thomas; E. H. Fitzhugh, St. Albans; W. P. Fitzsimons, Detroit; J. H. Hanna, Hamilton; G. H. Hanna, Montreal; C. A. High, Portland; J. Hobson, Montreal; F. A. Howe, Chicago; Dr. Hutchison, Montreal; R. H. Ingram, St. Albans; G. C. Jones, Montreal; R. S. Logan, Montreal; J. W. Loud, Montreal; F. H. McGuigan, Montreal; Prof. McLeod, Montreal; W. McWood, Montreal; E. W. Meddaugh, Detroit; F. W. Morse, Montreal; J. H. Muir, Detroit; D. O. Pease, Montreal; C. Percy, Montreal; H. Philips, Montreal; L. J. Power, Montreal; J. Pullen, Montreal; J. E. Quick, Toronto; A. F. Read, Montreal; G. B. Reeve, Montreal; M. M. Reynolds, St. Albans; A. E. Rosevear, Montreal; W. H. Rosevear, Montreal; F. Scott, Montreal; C. E. Soule, St. Albans; M. C. Sturtevant, Montreal; W. R. Tiffin, Allandale; G. W. Vaux, Chicago; W. Wainwright, Montreal; H. W. Walker, Montreal; F. J. Watson, Montreal; A. White, Toronto, C. M. Wilds, St. Albans; H. A. Woods, Detroit.

During the evening Mr. Hays was presented with a handsome album. Mr. Davis made the presentation, supplemented by suitable expressions from Mr. Wainwright. The leaves of the album are 11 by 14 ins., made of 16-ply cardboard, covered with English antique cloud grey paper, the edges gilded. The first page of the album bears a beautifully engrossed inscription, which reads as follows: "From the Official Family of the Grand Trunk & Central Vermont Ry. Systems to Mr. Charles Melville Hays, on his retirement from the management of these properties to accept the Presidency of the Southern Pacific Co., Dec., 1900." On the face of each of the other leaves appear excellent portraits of the officials of both the Grand Trunk & Central Vermont Railway Systems, preceded on the 2nd, 3rd & 4th pages with large portraits of Sir Charles Rivers-Wilson, President, J. Price, Vice-President, & G. B. Reeve, Mr. Hays' successor, now 2nd Vice-President & General Manager. The last leaf of the album contains a splendid view of the residence occupied by Mr. Hays during his stay in Montreal. On the reverse side of the album leaves appear photographic gems of scenes along the line of

the G.T.R. System, chosen from thousands of negatives which have been secured during Mr. Hays' regime. The collection embodies scenes of land & water, illustrating the magnificent scenery located on the line, & the charming resorts that have been & are being developed in the interests of the Co. Portland to Chicago is portrayed in artistic effects. Surf scenes from the Atlantic sea coast, towering peaks in the White Mountains, the quiet pastoral scenes along the line between Montreal & Toronto, & typical scenes from the highlands of Ontario, as well as views of some of the great engineering feats, such as the St. Clair tunnel, the steel arch bridge of the Niagara gorge & the Victoria Jubilee bridge over the St. Lawrence at Montreal, are included. The tout ensemble is a novel & most interesting creation, that will in the future recall pleasant memories of old associations to Mr. Hays. The album is bound in genuine levant morocco, with padded covers, & handsomely mounted in sterling silver. As an artistic production & a demonstration of photographic art it is probably unsurpassed. Mr. Hays made a most felicitous acknowledgment.

Mr. Hays & his family left Montreal Dec. 23 for St. Louis, Mo., where he intended spending a week, & then leaving for New Orleans to go over the Southern Pacific to San Francisco.

On his way through Toronto he was met by A. White & a number of other local officials, who gave him a hearty send-off. He thanked them for their loyal support, expressing the hope that the same would be given to Mr. Reeve.

G.T.R. Fast Running.—On Dec. 3, the G.T.R. Eastern Flyer made a record run from Toronto to Montreal, covering the 333 miles in 7 hours 45 mins., including stoppage. It was an unusually heavy train, consisting of 6 coaches—under ordinary circumstances it consists of 4—& there were altogether 20 stops on the trip. Two of the stops were due to changes of engines, & they occupied 8 minutes. Two other stops were for the purpose of taking water, & they consumed about 6 minutes. The most remarkable part of the run was between Brockville & Montreal, 127 miles. The actual time occupied was 160 minutes. There were 11 stops, 10 at stations & 1 for water, averaging about 3 minutes. Deducting 32 minutes dead time from the 160 leaves actually 128 minutes for the 127 miles. This is regarded as an exceptionally fine run for that distance.

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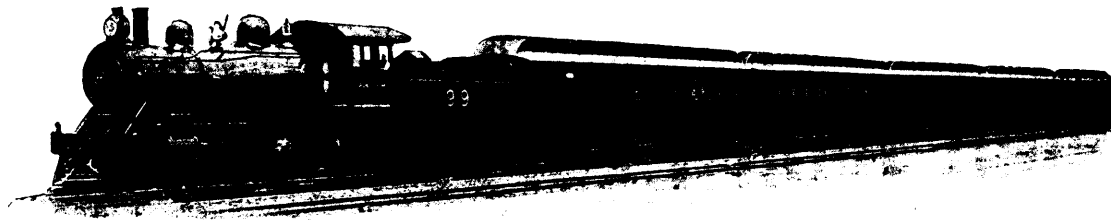
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WE MAKE SCALES FOR ALL PURPOSES. ALSO THE REED RECORDING ATTACHMENT FOR RAILROAD TRACK SCALES.

Write For Descriptive Circular.

The Gurney Scale Co.,

HAMILTON, ONT., CANADA.



A GRAND TRUNK RY. STANDARD TRAIN.

The C.P.R. & the I.C.R.

The Minister of Railways, Mr. Blair, was entertained at dinner by the Liberals of St. John, N.B., Nov. 30. In the course of his speech he said: "It has been said that the announcement which was recently made by the C.P.R. concerning winter trade was the result of my having been turned down by the Premier & my colleagues. The implication was made that the stand which I had taken had been abandoned. I am prepared in the administration of the office which I have the honor to hold to treat the C.P.R. in all its interests & upon all questions that may arise as if it had not fought me to the death on Nov. 7. My references to-night are dragged from me because I cannot allow the impression to go abroad that the Premier or my colleagues have changed my attitude upon this question, or that it is changed. If the C.P.R. desired its interests to be served here in the best possible way it would have been well if the Opposition press had been muzzled rather than that any declaration should have been forced from me. I cannot allow myself to be placed in any false position, & I want to say that it is not correct to attribute to the Premier or my colleagues any intention to have me yield in my attitude upon this question. They have not done so; they have not tried to do it. I had not even heard of it until I read it in the papers. I am, of course, willing at all times to negotiate with the C.P.R. upon any matter affecting its interests, & in a perfectly friendly way. I would go out of my way to meet it in such a spirit; but I am not going to surrender what I have always contended were the vital interests of the Intercolonial, or to recede from the position I have publicly taken." Mr. Blair said he did not wonder at the attitude taken by Mr. Shaughnessy, because that gentleman had been badly advised. He was deceived through the attitude of the St. John Common Council & members of the Board of Trade. There was no reason why the C.P.R. & the I.C.R. should not stand in the friendliest relations towards one another. They have many interests in common, & not necessarily any grounds for antagonism. The field is going to be broad enough & productive enough to afford business for both. This will certainly be true if the policy of the Government is carried out, & he felt that it would be carried out, because it was going to have 15 years at least in which to carry it to fruition.

The frequency of train robberies in the systems operating in the southern & Western States has led to very stringent measures on the part of the companies. The Union Pacific Ry. has put armed guards on its trains carrying money or bullion. The Burlington offers a standing reward of \$1,000 for the capture or killing of a train robber. The Iron Mountain, in conjunction with the Pacific Express Co., has offered \$500 for the arrest & conviction of train robbers & 10% of the stolen money returned.

Westinghouse Air Brake Co.

At the recent annual meeting at Wilmerding, Pa., the report showed that the income for the past fiscal year was \$8,530,905.21, & disbursements, \$5,011,706.46, leaving a net profit of \$3,519,198.75. The disbursements include \$3,534,710.03 for material & wages, & the remainder, \$476,996.43, covered the purchase of valuable patents relating to electric braking & heating apparatus for street cars, alterations of buildings, installation of new power plants, & general expense. The electromagnetic braking & heating apparatus, covered by the patents referred to, has been tested thoroughly, & arrangements have been made



INTERIOR SLEEPING CAR RUN ON G.T.R. TRAINS 3 AND 4.

to begin its manufacture on a large scale, as there is believed to be a good demand in store for this new invention, based on the greater safety to the public & the comfortable heating of cars, obtained without the use of any of the current from the power circuits. The friction draft gear, the right to manufacture which has been acquired by the Co., has been applied to nearly 3,000 steel cars, as well as to many locomotives. The rapid deterioration of the ordinary type of brake, due to the heavy steel & other cars, has caused the advantages of the friction draft gear to be appreciated by railways, & there is said to be an increasing inquiry for this apparatus that is indicative of much larger business from this source. Practically all of the unimproved property available has been utilized by the Co. for the erection of dwellings of a suitable class that have been readily rented at a rate that provides a satisfactory return for the investment. The foreign business of the Co. is said to be in a very satisfactory condition & growing rapidly.

"Trains Three & Four" is the title of a well printed & beautifully illustrated booklet, describing these fast & luxurious trains on the G. T. R., & briefly their routes. It is thoroughly up to the standard of the Co.'s Passenger Department literature. Three of the views in it are reproduced on this page.

Brotherhood of Railway Trackmen.—The third biennial session was

held at St. Louis, Mo., early in Dec. The following officers were elected:—J. T. Wilson, St. Louis, Grand President; A. B. Lowe, Kingston, Ont., 1st Vice-President; J. W. Davenport, Sandifer, N.C., 2nd Vice-President; W. W. Haygood, Atlanta, Ga., 3rd Vice-President & National Organizer; J. C. Lambert, Fort Worth, Tex.; J. S. Eastman, Pompanoosuo, Vt.; C. Boyle, Merrickville, Ont., & S. E. Hawes, Augusta, Ga., members of Executive Committee. J. T. Wilson, Grand President, will also act as Secretary & Treasurer, employing his own assistants, in order to keep down the expenses of the organization. T. G. Manamon, of Vancouver, B.C., was nominated for the Executive, but declined to stand. St. Louis was again selected for the next convention in 1902.

By the bursting of a crown sheet on locomotive 702 on the Wabigoon section of the C.P.R., Nov. 17, Fireman J. D. Mullins was scalded so badly that he died in a short time.

Picketing as a means of conducting strikes has been legalized by the British courts in dissolving the injunction secured by the Taff Vale Ry. Co. against the Amalgamated Society of Railway Servants.

Referring to a recent story from New York that a combination of extensive railway interests in the Western States was on the tapis, which would result in the Canadian Pacific, Northern Pacific, Great Northern, Erie, & the Chicago, Milwaukee & St. Paul railways being operated in harmony as a transcontinental line between Vancouver & New York, President Shaughnessy, of the C. P. R., said:—"While there is the very best of feeling between all the roads mentioned & the Canadian Pacific, there is no combination of any kind. The roads mentioned may work more harmoniously in the future than in the past, as it is in their interests to do, but there is no truth in the story of a combination & a new transcontinental railway."



INTERIOR CAFE-PARLOR CAR ON G.T.R. TRAINS 3 AND 4.

Enameled Iron Express Signs.

Guaranteed not to fade or in any way to perish from exposure.



No. 1. Size 14 x 26 1/2 inches, including flange at right angle. White letters on blue ground. Lettered on both sides.



No. 2. Size 14 x 26 inches, including flat flange. White letters on blue ground. Lettered on both sides.



No. 3. Size 24 x 3 inches. White letters on blue ground.



No. 4. Size 30 x 3 inches. White letters on blue ground.

These Signs are used largely by the Canadian and Dominion Express Companies and we can refer to Mr. W. S. Stout, Vice-President and General Manager of the Dominion Express Co., and to Mr. J. Bryce, Manager of the Canadian Express Co., as to their quality.

Enameled Iron Signs can be made in any shapes, sizes or colors. Blue and white form the most striking contrast and are the most effective.

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Prices and Further Particulars on Application.
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The Acton Burrows Co., 29 Melinda Street, Toronto.

Importers of Enameled Iron Signs of the best English manufacture.
Dealers in Lithographed Tin and Iron Signs.

CURRENT TOPICS.

The G.T.R. General Managership.

The retirement of General Manager Hays is not only a serious loss to the G.T.R. Co., but to the Canadian railway service generally & to the Dominion. In the ordinary course of events it was hardly to be expected that he would remain permanently with the G.T.R., the highest office in its service being a general managership, while on the other side of the line there are so many roads with the tempting position of president to be secured by practical men. But it was thought that he would be likely to remain here at least a few years longer, until the various betterments he had planned had been carried out.

In the five short years since Mr. Hays came to Canada he has accomplished great & in some instances marvellous work. The record of this was given so fully in our August issue that we will not refer to it now further than to briefly point out that the physical condition of the property has been enormously improved; the permanent way has been changed in alignment, gradients & structures, so as to permit of the hauling of vastly increased loads & the making of better time; buildings, structures, &c., have been modernized, & one out of three most important works undertaken has been completed, the rebuilding of the Victoria bridge, while similar work on the International bridge & the building of general offices in Montreal are well under way. Equally great improvements have been made in the equipment & in the operation of the line.

In the financial branch excellent paying arrangements have been made with the C.P.R., with the Wabash, & with the Intercolonial for running rights, the Central Vermont & the Chicago & G.T. have been reorganized & put on a sound basis, with the almost certainty that the financial results will be eminently satisfactory, net earnings have been largely increased, & the stock, &c., of the Co. has appreciated many millions during the past five years.

No doubt Mr. Hays was fortunate in taking hold of the G.T.R. just when times commenced to improve & some of the credit for the changed financial position of the Co. must be attributed to that cause, but the larger portion of the improvement is undoubtedly due to the changed methods he introduced & to the work of the able staff with which he surrounded himself.

Mr. Hays' relations with the public have been singularly happy. He has confined himself strictly to his duties as a railway official, has never obtruded in any other capacity & has been uniformly courteous in his administration.

Personally we desire to express our warm appreciation of Mr. Hays' unflinching readiness to co-operate with us in furnishing the latest reliable information about the affairs & operations of the G.T.R. At the very first he realized our desire to publish the fullest & most authentic information possible, & saw that it was to the interest of the Co. to furnish it. In the first interview the writer had with him, Mr. Hays said he fully appreciated the importance of a railway paper securing absolutely reliable information & that he would prefer to be asked for it, no matter how frequently, rather than have incorrect or incomplete matter published. As a result our relations with him have been of a most pleasant nature. No matter how often we requested information, he never advanced the "I can't be bothered" plea, or failed to reply promptly, his practice in this respect being in marked contrast to that of some other railway officials, though we are glad to say they are few in number, who either fail to reply to civil enquiries or answer so tardily that when it does come to hand it is of no use.

In expressing regret at Mr. Hays' return to the United States we are sure we are correctly voicing public opinion in Canada.

The appointment of Geo. B. Reeve to succeed Mr. Hays came as a great surprise, his name not having been among the several which were mentioned by the rumor mongers. When he retired from the General Traffic Managership of the Co. last spring it was thought that he would not enter the railway service again under any circumstances. He had been with the Co. for 40 years, was understood to have amassed a comfortable competence, he received a liberal pension from the superannuation fund, & he had a charming property in Southern California to which he retired with the intention of spending the balance of his life. His selection is a tribute to his undoubted great ability & the appointment has been received with enthusiasm. Though an old servant of the Co., he is one of the new school in his methods, his location at Chicago in the C. & G.T. service has given him an international experience, & there will be no cessation of the vigorous policy of management introduced by Mr. Hays, in which Mr. Reeve took part for over four years. While satisfactory on the ground of efficiency, the appointment is extremely popular with the public & with the officials & employes of the Co.

It may be interesting to reproduce the remarks made by President Sir Rivers Wilson at the semi-annual meeting of the Co. last spring, when he said:—"I am sorry to have to announce to you that our General Traffic Manager, Mr. Reeve, after a long & successful & faithful service of 40 years, is about to retire from our service—he will retire on May 1 next. It is a matter of the most sincere regret to us that he is leaving us, because his services are quite of an exceptional character. He is a man who has been devoted to our interest for very many years. He has brought intelligence of a high order to bear, & the result of his work has been most valuable & most useful to the interests of this Co. I think it is only due to him & it will be only interesting to you, that I should read to you the words of Mr. Hays in announcing to us the most regrettable circumstance of Mr. Reeve's retirement. He writes this:—"Mr. Reeve has filled the position of telegraph operator, agent, train despatcher, soliciting for freight agent, division freight, & finally General Traffic Manager, in which position he has performed the duties of the office energetically & faithfully, & to the credit of the Co. he represents," & Mr. Hays goes on to say—"I need hardly say I shall part with Mr. Reeve with extreme regret. I have never had an officer associated with me in the position occupied by Mr. Reeve, in whose judgment, zeal & fidelity I placed greater confidence. His long connection with & consequent familiarity with the traffic conditions of the property have made his services highly valuable." Well, that tribute from Mr. Hays, than whom there is not a better judge on the continent of America, is a very high tribute indeed to the value of Mr. Reeve's services. We shall part with him with the utmost possible regret."

Wide Rail Base.

An important departure, the result of which will be watched with interest, is being made by the G.T.R. on the second track which is being laid between Hamilton & Niagara Falls. The new rail is the American Society of Civil Engineers' standard 80-lb section, in every respect except that 1 in. has been added to the width of the base, & 1/8 in. to the height (in the base), making base of rail 6, instead of 5 in. wide, increasing the bearing surface on a tie with 8 in. face from 40 to 48 sq. in. or 20%. By this very large increase of bearing surface, it is hoped to prolong the wearing

capacity & life of cedar ties from 20 to 25%. The additional steel used in the rail, in order to provide the wider base, makes the weight 90, instead of 80 lbs. per yard.

Government Railway for Manitoba.

Several deputations from Western Manitoba have recently waited on Provincial Premier Roblin, urging additional railway construction. Mr. Roblin is reported as having said that for some reason neither the C.P.R. nor the N.P.R. intended to increase their lines in the Province. He stated definitely that the Government would build a road, but was not prepared to say what the route would be. He would, with his colleagues, give the matter immediate attention, & the road would be constructed in districts where the greatest good would accrue to the greatest numbers. In speaking at Morden recently Hon. R. Rogers said the Government was determined to secure a 10c. wheat rate to Lake Superior, although it might take some time to do so.

The "Soo" Line's Improved Position.

By reference to the half-yearly statement of the C.P.R. Co. to June 30 last, it will be seen that the Minneapolis, St. Paul & Sault Ste. Marie Ry. Co. has been enabled to pay back the balance of interest advanced to it by the C.P.R. Co., amounting to \$638,846.80. This is a very satisfactory showing for the subsidiary line, which is a valuable feeder to the parent system, & which may reasonably be expected for the future to take care of itself, notwithstanding the predictions of the croakers who have been pointing to its construction & acquirement by the C.P.R. Co. as a mistake. We have always looked on the acquirement of the "Soo" line as an evidence of sound foresight on the part of the C.P.R. management, & results are endorsing in this opinion.

Extension of the Intercolonial.

At the recent farewell dinner to Mr. Hays in Montreal, the Minister of Railways was very emphatic in expressing his desire to see the I.C.R. extended westward. It will be seen by the report on another page he said the road was not going to stop at Montreal, & predicted its extension to Sault Ste. Marie. It looks as though this question would be a live one during the term of the recently elected parliament.

Acetylene Gas on Steamboats.

Capt. Donnelly, in speaking at the recent dinner of the Canadian Electrical Association in Kingston, said that in inspecting a steamboat a short time since he found it lit by acetylene gas, which was contrary not only to Canadian marine laws, but to all reason, as it can only be safely used in a dry & cool place, & such an atmosphere is not found on a steamboat. This is a matter that steamboat owners will do well to bear in mind.

The Michigan Central Ry. has raised its telegraphers' salaries about 15%.

The Secretary of the Canadian Manufacturers' Association has received a letter from the Department of Railways to the effect that in future before any change in railway rates, classifications or regulations is endorsed by the Government a committee of the Association will be given an opportunity of expressing the views of the manufacturers regarding the proposed changes.

As a train was moving out of a Scotch station, a man in one of the compartments noticed that the porter in whose charge he had left his baggage had not put it into the van, & so shouted out to him:

"Hi, you old fool! What do you mean by not putting my luggage into your van?"

The porter replied: "Ah, man, your luggage is ne'er such a fool as yourself. You're on the wrong train."

RAILWAY APPOINTMENTS, ETC.

Canada Atlantic.—A. E. Campbell, formerly station agent at Ayleen Lake, has been appointed agent at Kinburn, vice W. J. Duverville, relieved.

Canadian Pacific.—A widely circulated report that J. A. Sheffield, Superintendent of Sleeping, Dining & Parlor Cars & Hotels, was leaving the Co.'s service, has been denied. He has been relieved of the oversight of the Place Viger & Chateau Frontenac Hotels, the managers of which will hereafter report direct to the General Manager. The other hotels of the Co. will remain under him, & he will now have more & much needed time to attend to the other duties of his position.

A. V. Fabien, of the General Passenger Department, has been appointed Excursion Clerk, succeeding A. C. Shaw, appointed acting General Agent of the Passenger Department at Chicago.

F. W. Peters, heretofore Assistant General Freight Agent of the Kootenay & Boundary lines at Nelson, has been appointed Assistant General Freight Agent of the Pacific Division at Vancouver, vice Allan Cameron, who has

been appointed Asiatic Manager of the Oregon Ry. & Navigation Co. at Hong Kong.

H. D. Macdonnell, heretofore Travelling Freight Agent at Nelson, has been appointed Assistant General Freight Agent Kootenay & Boundary lines, succeeding F. W. Peters, promoted.

Geo. Stephen has been appointed Travelling Freight Agent at Nelson, succeeding H. D. Macdonnell, promoted.

Jas. Bonner has been appointed Assistant Auditor of Freight & Telegraph Receipts.

A. A. Goodchild, heretofore Assistant Auditor of Disbursements, has been appointed Auditor of Statistics.

Central Vermont.—R. H. Ingram having resigned to accept the position of Secretary to President Hays, of the Southern Pacific, W. H. Chaffee has been elected Clerk & Treasurer of the C.V. Co.

E. D. Nash has been appointed Assistant Superintendent Southern Division at New London, Conn., vice W. T. Sutphen, assigned to other duties. Mr. Nash was Trainmaster, & has been succeeded by J. Keefe.

Grand Trunk.—W. Wainwright, heretofore General Assistant, has been appointed

General Assistant & Comptroller. In addition to the duties he has been performing, parliamentary work, &c., he will have supervision of the financial departments of the Co.

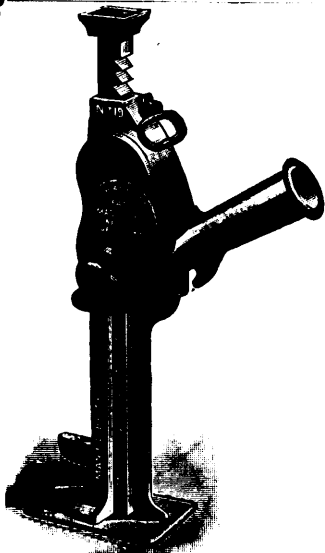
F. Scott, heretofore Assistant Treasurer of lines east of the Detroit & St. Clair rivers, has been appointed Treasurer, vice C. Percy, resigned.

R. S. Logan, heretofore Secretary to the General Manager, has been appointed Assistant to General Manager.

H. F. Tilley has been appointed ticket Agent at Niagara Falls, N.Y., vice G. W. Wood.

W. J. Gilkerson has been appointed Travelling Passenger Agent at Chicago, Ill., vice F. S. Capron, resigned. M. J. Corcoran has been appointed Travelling Passenger Agent at Chicago, vice E. B. Rowland, resigned.

The following agents have been installed: North Yarmouth, C. W. Merrow; Oakville, M. H. Hammond; Bluevale, C. McGuire; Blyth, R. J. Martin; Brent Creek, H. Megiveron; Belsay, F. E. Thomas; Davison, L. B. Chrouch; Nunica, W. L. Kerr; Harvard, G. R. Sillaway; Middleton, W. J. La Due; Pompei, M. E. Hathaway; Gooding, H. H. Earl; Fort Gratiot, Freight, & Port Huron,

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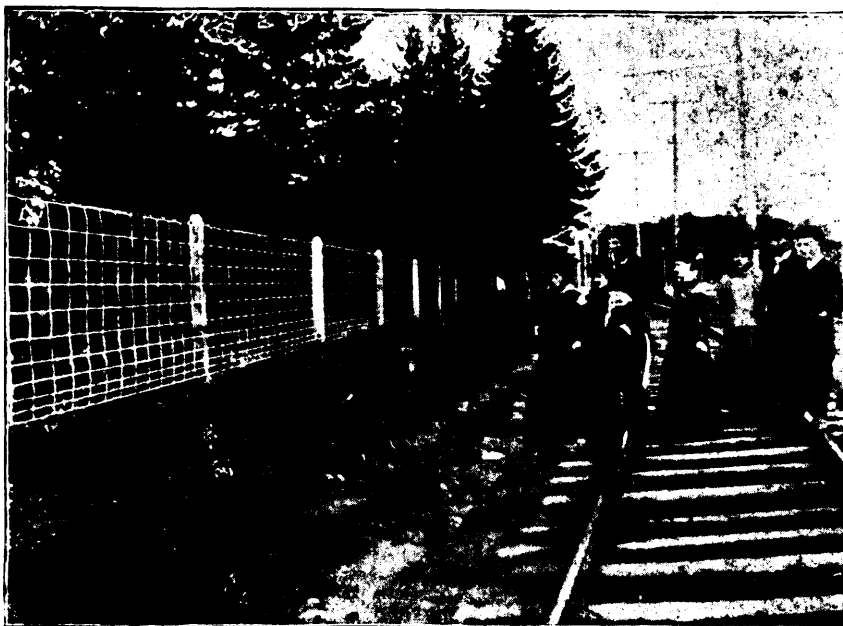
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Freight, J. T. Waters; Washington, H. G. Henderson.

Great Northern of Canada.—W. A. Kingsland has been appointed Auditor. He was in the New York Central audit department for about 10 years.

Intercolonial.—Early in Dec. there were a lot of daily press rumors about changes on the I.C.R., to the effect that C. Schrieber, Deputy Minister of Railways, was about to be superannuated, that A. Davis, C.E., of Montreal, was to be appointed General Inspector of the I.C.R., & that W. Wainwright, or F. H. McGuigan, of the G.T.R., would succeed D. Pottinger as General Manager. All of them were denied by the Minister of Railways. The absurdity of the rumor about Messrs. Wainwright & McGuigan should have been its own contradiction, as neither of them would leave better positions for the less satisfactory service of a Government road.

Michigan Central.—T. C. Beal has been appointed Travelling Freight Agent, with office at Chicago, vice H. Shearer.

Minneapolis, St. Paul & Sault Ste. Marie.—G. R. Huntington has been appointed General Superintendent, with headquarters at Minneapolis. F. W. Curtis has been appointed Superintendent Wisconsin & Peninsula Division, vice G. R. Huntington.

New York Central.—W. Randolph has been appointed Excursion Manager with headquarters at 377 Main street, Buffalo. His territory comprises the country tributary to the main line of the N.Y.C. from Syracuse to Buffalo & Niagara Falls, & the western division branches.

Northern Navigation Co.—J. R. Promberger has been appointed Manager, with headquarters at Collingwood. For about a year he has been Freight Agent of the C.P.R. at Fort William, having gone there from Milwaukee.

Northern Pacific.—General Superintendent Kimberley having retired on account of ill health, Assistant General Superintendent Law has been promoted to succeed him.

Richelieu & Ontario Navigation Co.—H. F. Chaffee, heretofore City Ticket Agent at Montreal, has been appointed Western Passenger Agent at Toronto, effective Feb. 1

J. F. Dolan, City Ticket Agent at Toronto, has been appointed to succeed H. F. Chaffee as City Ticket Agent at Montreal. Effective Feb. 1.

Mainly About People.

M. R. Davis has been appointed Inspector of Hulls & Equipments of Steamboats, with headquarters at Kingston, Ont.

H. Phillips, who was travelling secretary to C. M. Hays on the G.T.R., has gone with him to the Southern Pacific.

J. J. Anderson, heretofore C.P.R. Ticket Agent at North Bay, has been appointed Ticket Agent for the T.H. & B.R. & the C.P.R. at Hamilton.

Mrs. Magrath, wife of the Land Commissioner of the Alberta Ry. & Coal Co., at Lethbridge, is spending the holiday season with her mother, Lady Alexander Galt, in Montreal.

F. E. Ward, at one time employed in the G.T.R. offices at Montreal, has been appointed General Superintendent of the Seattle & Northern division of the Great Northern Ry.

A. E. Domville, Manager of the St. Thomas Car Wheel Co.'s works at St. Thomas, Ont., has been appointed General Manager of the Griffin Car Wheel Co. at Barrow-in-Furness, Eng.

H. C. Hammond, of Osler & Hammond, Toronto, & of Osler, Hammond & Nanson, Winnipeg, & President of the Calgary & Edmonton Ry., spent part of December in Winnipeg on business.

W. H. Chaffee, recently appointed Clerk & Treasurer of the Central Vermont Ry., is a native of St. Albans, Vt., & has been in the Treasurer's Department for some time. He was formerly in the G.T.R. service in Montreal.

J. L. Weller has been appointed Engineer of the Welland canal, vice W. G. Thompson, resigned. Mr. Weller has recently been in charge of the Government work at Port Colborne & was formerly Assistant Engineer of the Cornwall canal.

W. Stitt, Assistant General Passenger Agent of the C.P.R. at Winnipeg, will leave early in Jan. for Australia to look into matters connected with the Co.'s passenger business. He will return via China & Japan & will be absent about four months.

Sir Wm. Van Horne, C. R. Hosmer, R. B. Angus, E. B. Osler, & W. D. Mathews, all directors of the C.P.R., are applying for a Dominion charter for the Pacific Coal Co., Ltd., with a capital of \$4,000,000, & head office at Montreal, to carry on business as colliery proprietors, coal & coke manufacturers, smelters, etc., in the Northwest.

J. N. Hill has been elected President of the Montana Central. This is believed to be one of the steps in the plan of J. J. Hill, President of the Great Northern system, to relieve himself of the burden of the management, taking for himself the Chairmanship of the directorate. L. W. Hill has been made President of the Eastern Minnesota, & it is thought President J. J. Hill will retire in favor of his sons from the presidency of the Great Northern.

Frank Scott, recently appointed Treasurer of the G.T.R. lines east of the Detroit & St. Clair Rivers, has been in the employ of the G.T.R. since 1879. He entered the Audit department as a clerk in 1879 & was transferred to the Treasurer's department & appointed Secretary Stores Committee & Board of Audit in 1892. In 1893, when C. Percy was made Treasurer, to succeed R. Wright, Mr. Scott was promoted to the position of Assistant Treasurer, which position he has filled ever since, until Mr. Percy's resignation gave him the Treasurership. In 1897 he was also appointed Secretary of the Superannuation Association.

Wm. Wainwright, recently appointed General Assistant & Comptroller of the G.T.R. System, was born in Manchester, Eng., April 30, 1840. He was educated in his native city & entered the service of the Manchester, Sheffield & Lincolnshire Ry., as junior clerk in the accountant's office, in 1858, subsequently becoming senior clerk & Secretary to the General Manager, resigning these positions at the suggestion of Sir E. Watkin, then Chairman of the M.S. & L.R., & Superintending Commissioner of the Grand Trunk Ry. He came to Canada in 1862 as senior clerk in the Chief Accountant's office of the G.T.R. in Montreal, which position he held one year, & was thereafter successively 3 years Managing Director's Secretary, 6 years senior clerk Managing Director & in charge of Car Mileage Department, 8 years & 5 months General Passenger Agent, May, 1881 to Jan., 1891, Assistant Manager, Jan., 1891 to May, 1896, Assistant General Manager, May, 1896 to Dec. 31, 1900, General Assistant. From April, 1883 to Sept., 1885, he was also General Manager of the North Shore Ry. He is a director of the Guarantee Co. of North America, & of the Montreal Telegraph Co., also a Director & Vice-President of the Richelieu & Ontario Navigation Co., & Vice-President of the Grand Trunk Insurance & Provident Society, & of its Superannuation Society. In religion he is an Anglican. He married first, in 1867, Rosabelle Hilda, daughter of R. Arnold, of Toronto, who died in 1876, & secondly, Mary Emily, sister of his first wife. He resides at 165 Metcalf St., Montreal, & is a member of the St. James & Rideau clubs.

Dominion Atlantic Railway Meeting.

A special general meeting was held at 6 Great Winchester St., London, Eng., Dec. 14. Mr. Kemp, who presided, in the course of some preliminary remarks referred to the way in which the Co.'s traffic was steadily growing, & to his own & to his colleagues' faith in future development. They believed good work was being achieved for the large territory which their system served. The directors desired to take powers mainly for the purpose of mortgaging the Co.'s fleet when they thought necessary, & they also thought it would be convenient at the same time to ask for further powers to issue the balance, £90,000, of the 4% 2nd debenture stock. Mr. Kemp referred to the negotiations which took place in the spring & summer with the Yarmouth Steamship Co., with a view to the acquisition by this Co. of that Co.'s vessels. Reference has been made before to the severe competition to which the Co. had been subjected; & in accordance with the shareholders' wishes, Mr. Ronald went to Canada shortly after the last annual meeting. The directors very carefully considered their colleague's report on his return, & they agreed with him that the best method of procedure was to make to the Yarmouth Co. an offer for the purchase of all its ships, &c., subject to the shareholders' consent. They offered the Yarmouth Co. in the end \$350,000. The Yarmouth Co. actually introduced a bill into the Dominion Parliament seeking powers to sell their undertaking to this Co. On June 26 a resolution was passed by the Yarmouth Co. declining this Co.'s offer, but in July the President of the former Co. put himself into personal communication with the directors of this Co. He (Mr. Kemp) was introduced to that gentleman by one of the most important stockholders in the Co., & at the suggestion of the President of the Yarmouth Co. the Board somewhat altered its terms, offering \$250,000 in cash, instead of \$175,000, & the balance, \$100,000, (secured on the Yarmouth Co.'s ships), to be paid in 2 years instead of 3, & the rate of interest to be 5% instead of 4%. According to the President of the Yarmouth Co., the matter was practically agreed & the directors were assured that they would have no further trouble. Whatever this gentleman's intentions might have been, he could only say that when they waited on his Co., in Nova Scotia, to take steps to carry through the arrangement, they were told that the President had been neither authorized nor instructed to agree to terms. The directors were proceeding on the policy, expressed to the shareholders several times, of confirming in the hands of this Co. the control of its trunk business.

The several resolutions submitted to the meeting were passed unanimously.

T. R. Ronald, Vice-President, in addressing the meeting, spoke of the satisfactory condition of the Co.'s property.

The following resolution was carried unanimously:—"That this meeting, having heard the report of the directors as to their negotiations for the acquisition of the Yarmouth Steamship Co.'s vessels & business, & the course of such negotiations, hereby approves of the action of the directors in relation thereto, & that the best thanks of the proprietors be given to the directors in connection therewith." The meeting terminated with a vote of thanks to the officers of the Co.

Not Up-to-Date.

Railway Agent—Our railway, madam, is strictly up-to-date in every respect.

Madam—Nonsense! Look at this woman on your excursion folder. Her sleeves have been out of style for three years.

The Midland Blast Furnace.

On Dec. 18, on the invitation of the Canada Iron Furnace Co., a party of nearly a hundred visited Midland, Ont., to attend the opening of the Co.'s blast furnace there. Several of the directors & a number of others left Montreal the night before, arriving at Toronto in the morning, where they were joined by the other guests, the whole party leaving Toronto at 9 a.m. by special train. A stop was made at Allandale for luncheon, after which a rapid run was made to Midland, which was en fete for the occasion. The special was run round the harbor on the C.I.F. Co.'s spur line to the furnace, where a run was witnessed, after the Premier of Ontario had christened the furnace & the Mayor of Midland had started the tapping. After seeing the run & the making of pig, the guests made a general tour of the works & a number of speeches were delivered. On the return journey another stop was made at Allandale for dinner, Toronto being reached about 9 p.m. The directorate was represented by G. E. & T. J. Drummond, of Montreal, who were indefatigable in their attentions to their guests. A very enjoyable feature of the outing was the presence of their brother, Dr. Drummond, author of "The Habitant," who was very heartily welcomed. Arthur White, Division Freight Agent of the G.T.R. at Toronto, assisted very materially in the arrangements.

The furnace proper is a cylinder or shell of steel set up vertically on 8 cast-iron columns. Its height is 64 ft., & its diameter at the bosh 13 ft. Its capacity per day of 24 hours is about 150 gross tons of iron. The lower part of the furnace, inside of the supporting columns, is protected by a water jacket, through which flows thousands of gallons of water per day for the purpose of cooling the outside of

the brick, & counteracting the intense heat from the crucible or inside.

Certain qualities & quantities of fuel, iron ore, & limestone are selected & decided, & then the furnace is charged. First, 3,600 lbs. of fuel is hoisted up on the steam elevator, where the top fillers or men dump it into the stopper, which has a bell or inserted valve at its bottom. When the entire charge of fuel is dumped into the hopper the valve or bell is lowered by means of steam, & the whole charge allowed to fall into the furnace. This practically constitutes one layer of fuel in the furnace, the inside of which is entirely built up with fire-brick, & shaped somewhat like an ordinary lamp chimney, the lower part being known as the "crucible," the wide or belly part the "bosh," & above this the "stack." Then a charge, consisting of 5,000 or 6,000 lbs. of ore & limestone is hoisted & dumped into the furnace on top of the fuel. Then another charge of fuel & then a charge of ore & limestone, & alternately fuel & ore & limestone continuously as long as the furnace runs, which, in many cases, is from 2 to 6 years. As fast as the stock in the furnace is consumed below it feeds down from the top, where the lever is shown by a try-rod, by the use of which the top-filler or attendant knows when to put in a fresh charge. This covers the top work, but below the work is entirely different.

At the bottom 8 tuyeres, or blow-pipes, are inserted at the crucible, & about 6 ft. from the hearth or bottom. The 8 tuyeres are inserted at regular distances around the crucible, & through them is forced the wind or blast, which causes combustion & melts the ores. Peep-holes protected by mica enable the furnaceman to tell when the slag or metal has reached a proper height in the crucible, & at the proper time he opens a small notch at the bottom of the furnace crucible & allows the

molten iron to pour out. It runs through an open sand trough down the centre of the cast-house, & is then conveyed into side beds through troughs or gutters in the sand, which are known as sows. Opening from the side of this sow are some 20 or 25 open moulds, which are known as pigs, & into these the molten iron is conveyed by means of the sow-channel. Here the metal cools, after which it is broken & carried out. It is then a commercial article known as pig iron. After the entire contents of the furnace crucible is drawn off the notch is plugged with clay & the furnace continues consuming its stock & making iron. Four casts are made each day, at regular intervals of 6 hours, & the day's output runs from 100 to 150 tons of iron, which necessitates the handling & consumption of about 150 tons of fuel, & 250 to 300 tons of ore & limestone, the latter being necessary for fluxing or cleansing the iron.

The two blowing engines are of the vertical type, each with 34-in. steam cylinders & 48-in. stroke. They are massive & powerfully built, & erected on heavy concrete foundations capped with granite. Around the upper portion runs a substantial iron gallery, or platform, which makes all upper parts of easy & safe access. Each engine is capable of blowing 10,000 cubic feet of air per minute.

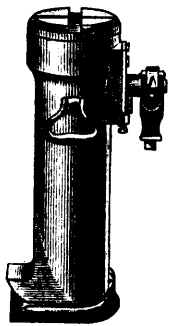
The steam pump equipment consists of two duplex outside packing pumps, 10-in. x 10-in. x 18-in. These are used for furnace & stove circulation, & also for fire purposes. There is also a duplex outside packing steam pump, size 8-in. x 5-ft. x 6-in., which is used for boiler feed purposes. All pumps are erected on a heavy concrete foundation, capped with blocks of granite.

There are 8 steam boilers, flue type, 52-in. in diameter & 25-ft. long, each having two 18-in. flues. The shells are double riveted,

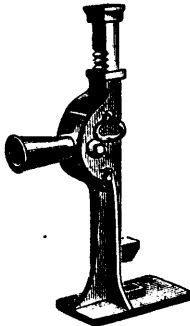
Norton's Ball Bearing Jacks.

Standard Wherever Jacks are Used.

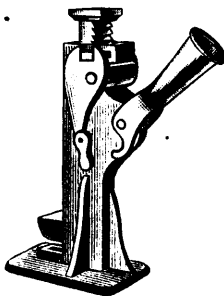
50 STYLES. 8 TO 70 TONS CAPACITY.



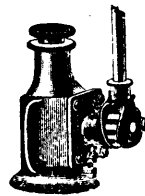
40 Ton Jack.



10 Ton Automatic Lowering Jack.



15 Ton Track Jack.



8 Ton Jack.

Guaranteed in every Respect.

Complete Illustrated Catalogue and Discount on application.

MADE IN CANADA BY

A. O. NORTON,
Coaticook,
Prov. Quebec.

STEEL, PEECH & TOZER,
LIMITED,
SHEFFIELD, ENGLAND.
STEEL AXLES, TYRES, AND
SPRING STEEL.

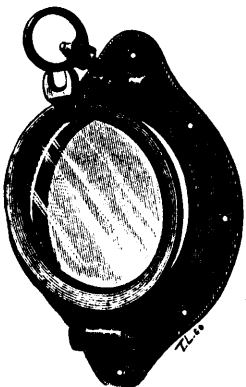
"PHENIX" Loco. Spring Steel is the
accepted Standard in Canada.

SOLE AGENTS:

James Hutton & Co., Montreal.

Going West and Northwest.

The best line west of Chicago, if you are going to any point in Montana, Idaho, Washington, Oregon, Kansas, Nebraska, Colorado, Wyoming, Utah, Nevada or California, is the CHICAGO, MILWAUKEE AND ST. PAUL RAILWAY. Direct & short lines between Chicago, Sioux City, Omaha, Milwaukee, La Crosse, St. Paul & Minneapolis. Solid vestibuled, electric lighted, steam-heated trains; free reclining chair cars; compartment & sleeping cars: the finest dining cars in the world. If you contemplate a trip West or Northwest call on any coupon ticket agent in the United States or write A. J. Taylor, Canadian Passenger Agent, 8 King Street E., Toronto, Ont., saying where you are going, about when you will start, how many there will be in the party, & full information, with maps, time tables, & rates of fare will be promptly furnished free. Be sure to ask for your tickets via C., M. & St. P. Ry.



**Ship Lamps, Head Lights,
Railway Signals and Lamps.**

COTTON WASTE—All Grades.

Write for Catalogue.

The N. L. Piper Railway Supply Co.,

MANUFACTURERS,

314 Front Street West, - TORONTO.



GUIDE To WINNIPEG,
MANITOBA,
TERRITORIES.
STOVEL'S
POCKET
DIRECTORY.
RAILWAY and
STEAMSHIP
TIMETABLES,
MAPS, Etc.
At Bookstores.
On Trains.
5c.

& the steam pressure is 90 lbs. They are set in 4 batteries of 2 each. Six boilers are sufficient to supply all the steam required, leaving the other two for facilitating cleaning or repairs. The boilers are heated by the waste gas from the furnace, & so arranged that coal or wood can be burned, as desired.

The chimney is constructed of steel, is 8 ft. 6 ins. in diameter, 174 ft. high, & is erected on a massive square base of concrete, faced with granite. The base is 20 ft. square at the bottom, & 20 ft. at the top, & stands 21 ft. high. The top of the chimney is ornamented with a substantial gallery of steel, which is protected with an iron railing, & which can be reached by means of an iron ladder on the outside of the chimney. This chimney is lined with fire-brick, & the inside diameter is 7 ft.

This tank is used partially as a stand-pipe, and partially as a reserve supply in case of accident to the pumps.

The hoist engine which operates the elevator is double cylinder, size 10 x 12 in., & is erected on a solid concrete foundation, capped with a massive block of granite.

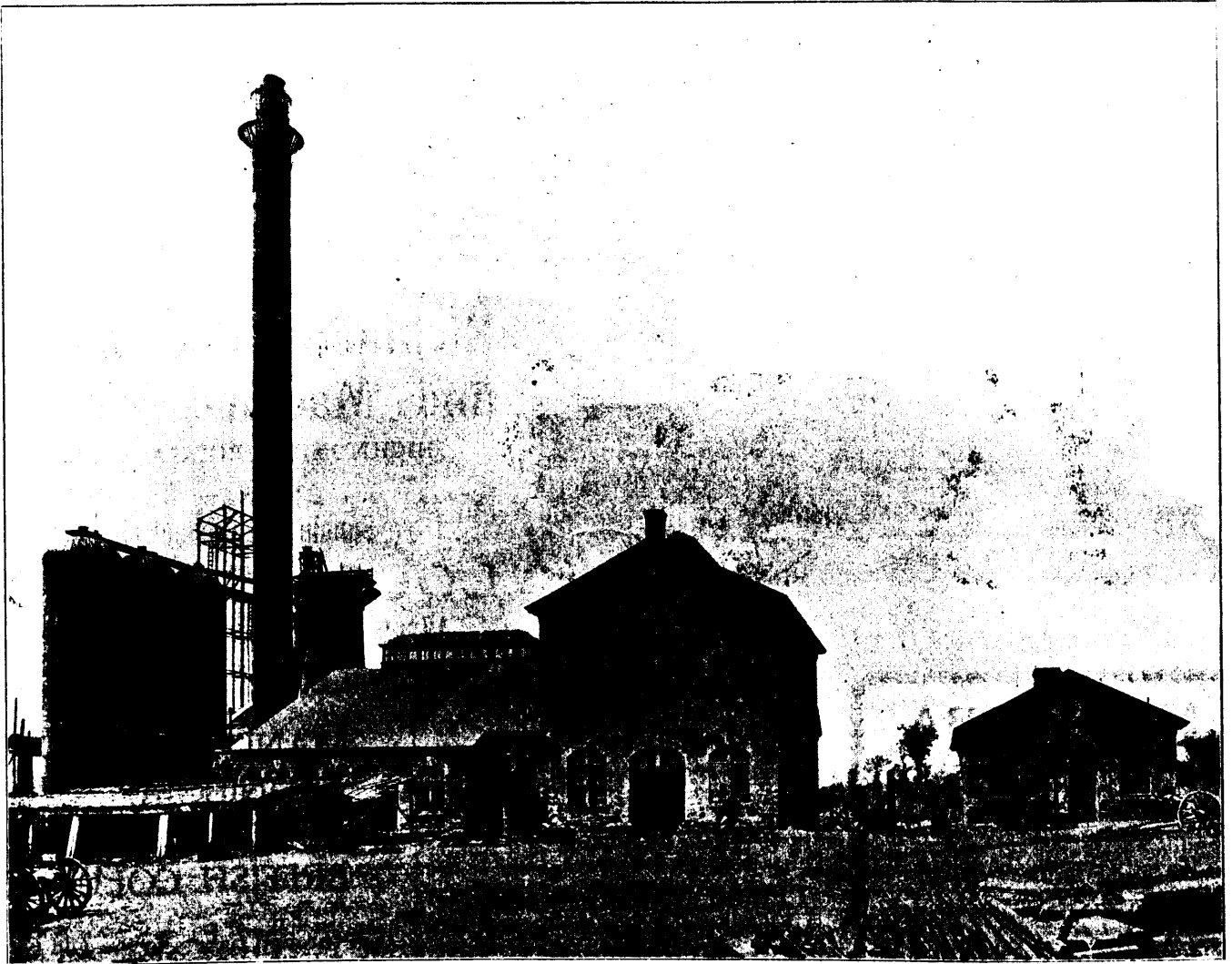
The stone-crushing equipment consists of one gyratory machine, capable of crushing 100 tons an hour, & is driven by a 25-h.p. boiler & engine; & one 10-in. stone-crusher, capable of crushing 25 tons an hour.

The machine & repair shop consists of a brick building 30 x 60 ft. x 11 ft. 6 in. high, erected on a concrete foundation, capped with granite. The shop is equipped with a complete blacksmith shop & tools, carpenter shop with rip & cross-cut saws, band-saw,

dump of stone. Inside of this is filled with solid earth, & the outside consists of the usual wooden pile wharf, which protects vessels from the stone front.

The vessel discharging ore at the wharf delivers it on to the stock ground, immediately in the rear of the furnace elevator. From this pile it is shovelled direct to the furnace barrows.

The pig iron is delivered from the front of the cast house on to the weighing & grading platform, whence it can be handled direct into railway cars or trams for conveyance to the wharf for shipment by water. The slag can either be delivered into a slag car or allowed to spread over the ground & broken up for the purpose of grading up the grounds generally & building wharves, & is run from



THE CANADA IRON FURNACE CO.'S PLANT AT MIDLAND, ONT.

It serves for both the boilers & the hot-blast stoves.

Hot-blast stove equipment consists of 3 fire-brick stoves of the two pass type. They are 16 ft. in diameter, 60 ft. high, & made of 5-16-in. steel, double riveted. The whole are provided with a complete outfit of modern valves, &c., & are erected on a solid concrete foundation, faced with granite, the size of which is 6 ft. 2 in. x 27 ft. 2 in. These stoves are capable of heating the blast up to 1,400 deg. Fah.

The water tank, or tower, is situated on the hill in the rear of the furnace, & is cylindrical in shape, 12 ft. diameter, 40 ft. high, made of 5-16-in. steel plate, double riveted. This tank is erected on a concrete foundation, the top of which is 72 ft. above the bay level.

lathe, & buzz planer, &c., and the machine shop with Bertram 20 x 16 in. lathe, emery stand, & two drilling machines, also a laboratory sample grinder, a 20-h.p. steam boiler & engine, shafting, pulleys, &c., & a steam pump.

The laboratory is situated in the temporary office building, & is fully equipped & up-to-date in every way. The staff consists of two chemists.

The Co.'s water front has an extent of about 1,700 ft., the greater portion of which has an available depth of 20 to 30 ft. of water. The wharf front now has an extent of 1,200 ft., & the solidity of the wharves already built can be judged by the fact that they now carry upwards of 54,000 tons of ore. The entire front of the wharf is faced with a heavy

the furnace at a point most convenient for all these purposes.

The ore used at the Midland furnace is from the Helen mine, from which it is carried over the Algoma Central Ry. to Michipocoton Harbor, & thence by that Co.'s steamers to Midland.

Chateau Frontenac Advertising.—A correspondent of Profitable Advertising is having some fun with the following, which is now running in a number of papers:

"Why go South when you have an ideal winter resort in the Chateau Frontenac, Quebec, Canada, the most attractive and one of the most comfortable hotels in the world, and has the grandest scenery, built at a cost of about a million dollars?"

The question is, who built the scenery at a cost of \$1,000,000?

Hydraulic Dredger for British Columbia.

The Polson Iron Works, Toronto, are building for the Dominion Government a self-propelling hydraulic dredger, which is to be transported to the Pacific Coast in sections & completed there by midsummer of this year. Following is a description as it will be when completed: It is capable of working to a depth of 40 ft. below the water surface & excavating any ordinary material, discharging it by either of three methods, viz., 1st, to shore through a long-distance pontoon pipe; 2nd, through a suspended side-discharge pipe, 85 ft. long, & 3rd, into scows alongside. It is self-propelling at a speed of 8 statute miles an hour. It is fitted with crew's quarters on the upper deck sufficient to accommodate 20 men. The machinery & equipment is first class in every respect & of a substantial description. The dredger, as a whole, is made of the very best materials & workmanship & adapted for permanent service in either fresh or salt water.

The hull is 125 ft. long, 32 ft. wide & 7 ft. 6 in. deep at the side. It is square ended at bow & stern for the purpose of carrying the suction pipe & stern wheel respectively, but has a rake on the underwater body forward & aft, & round bilges, making her easy to propel. The construction of the hull is composite, that is to say, it has steel frames & trusses over the entire length with the plank-

ing & sheathing of wood, by which great strength is obtained, the steel frames being practically indestructible, while the planking can be readily & cheaply renewed at any time when necessary from injury or decay. The hull is stiffened by two internal trusses extended the whole length of the boat, which also serves to carry the deck house & sustain the weight & thrust of the front A frame. It also furnishes the necessary support for the wheel beams at the after end. There are 4 watertight steel bulkheads, & each compartment is fitted with means of removing the bilge water independently. The keel is ingeniously constructed in the form of a gutter, which drains the perfectly flat bottom of the vessel completely & forms an efficient well for the pump suction.

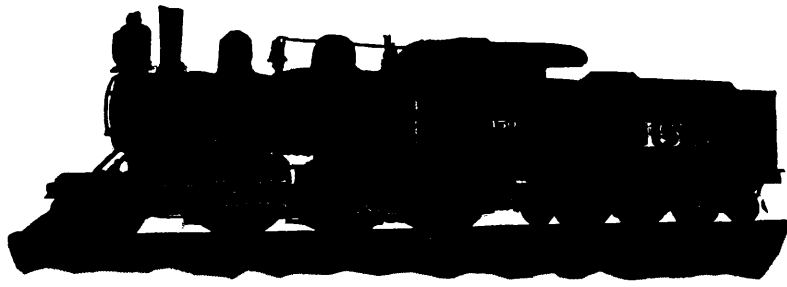
The main engines for driving the dredging pump are of the vertical triple expansion type—13½", 22" & 36" by 21" stroke of the standard marine type. The main dredging pump is centrifugal of improved type, having 20" diameter suction & discharge. The suction pipe is designed to make a cut 50 ft. wide when stationary & 175 ft. wide when swinging on the stern spud. A complete outfit of auxiliary machinery is provided for handling the suction pipe, spuds, anchors, hull, etc. The two boilers are of the Heine water-tube type, having 3,000 ft. of heating surface. The builders guarantee that the dredger is capable of doing effective work at 1,500 feet distance

from discharge with only one boiler in operation. There is a surface condenser of the latest & best construction, having 1,200 sq. ft. of coating surface. The vessel is propelled by a stern wheel 20 ft. diameter, driven by double-horizontal engines 16 in. diameter & 72 in. stroke, of the Polson Iron Works standard patterns, which have been thoroughly tested in service.

The hull will be ready for shipment about the middle of Jan. & will be erected at New Westminster & completed there by W. E. Redway, the Superintendent of the shipbuilding department of the Polson Iron Works.

Electricity for Motive Power on the C.P.R.—With reference to a paragraph which appears on pg. 360 of this issue, copied from the Nelson Miner, stating that the C.P.R. had decided to operate the Rossland, B.C., grade by electricity, we are informed that no decision has yet been arrived at in regard to the matter. Inquiries are being made with a view of ascertaining if it will be in the Co.'s interests to operate the grade by electricity. It will take considerable time to obtain all the information & an early decision is, therefore, not to be looked for.

The Canadian exhibit of railway ties at the Paris Exposition proved of such interest that a new trade may spring up in that line between this country & the Continent. Many enquiries are being made.



Richmond Locomotive and Machine Works,

RICHMOND, VIRGINIA, U.S.A.

BUILDERS OF

Simple and Compound

LOCOMOTIVES.

Adapted to every variety of service.

MANITOBA

The Government Crop Bulletin issued Dec. 12th, 1899, gives the following statistics for the year:

CROPS.		
ACRES.	AVERAGE YIELD.	TOTAL.
Wheat..... 1,629,995	17.13 bus.	27,922,230 bus.
Oats..... 575,136	38.80 "	22,318,378 "
Barley.... 182,912	29.4 "	5,379,156 "
Potatoes.. 19,151	168.5 "	3,226,395 "

STOCK.

Beef Cattle exported during the year	12,000
Stockers exported	35,000
Total value dairy products	\$470,559 09

10,500 FARM LABORERS

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

MANITOBA FARMERS ARE PROSPEROUS.

Farmers erected, last year, farm buildings valued at one and one-half million dollars.

MANITOBA LANDS—For sale by the Provincial Government. Over 1,600,000 acres of choice land in all parts of the Province are now offered at from \$2.00 to \$5.00 per acre. Payments extend over eight years. **Special Attention** is directed to 500,000 acres along the line of the Manitoba and Northwestern Railway at \$3.00 and \$3.50 per acre.

FREE HOMESTEADS are still available in many parts of the Province.

For full information, maps, etc., FREE, address J. A. DAVIDSON, Minister of Agriculture and Immigration, Winnipeg, Manitoba. Or JAMES HARTNEY, Manitoba Emigration Agt., Union Station, Toronto, Ont.

THE FAVORITE ROUTE

To New York and
.....Philadelphia

GRAND TRUNK RAILWAY

in connection with the

LEHIGH VALLEY RAILROAD

Route of the "Black Diamond Express," handsomest train in the world.

Leaving Toronto daily (except Sunday) at 9 a.m., Hamilton 9.55 a.m., arrive New York 10.08 p.m.

Fast Night New York and Philadelphia Express, leaving Toronto 6.15 p.m. daily, arrive New York 9.38 a.m., Philadelphia 8.56 a.m.

Pullman Sleepers from Toronto, Hamilton and London to New York and Buffalo to Philadelphia.

Call on Grand Trunk Ticket Agents for tickets and further information, or address

Robt. S. Lewis,

Canadian Passg'r Agt., 33 Yonge St., Toronto.

Geo. R. Chesbrough,

West'n Passg'r Agt., Buffalo, N.Y.

Chas. S. Lee,

Gen'l Passg'r Agt., New York.

A. A. Heard,

Ass't Gen'l Passg'r Agt., New York.

All C.P.R. Agents in

MANITOBA,
ASSINIBOLA,
ALBERTA and
BRITISH COLUMBIA

sell through tickets to the Old Country, cheaper than if passengers bought railway tickets to New York or Montreal, and then re-booked.

They also sell prepaid tickets to passengers coming from the old country, cheaper than the rate obtainable in Europe, and on favorable terms.

Apply to any agent Port Arthur and west, or to

W. P. F. CUMMINGS,

C.P.R. Offices,
WINNIPEG.

Atlantic Type Locomotives.

The Record of Recent Construction No. 20, issued by the Baldwin Locomotive Works, is devoted to Atlantic type locomotives. Since its introduction in 1895 this type has proven its special fitness for fast passenger service, & has been employed for some of the most notable high-speed trains running. The "Record" referred to is devoted to the illustration of this type, giving, so far as possible, in each instance, records of actual performance in regular service.

The Atlantic type of engine came into existence to meet the conditions essential to the modern high-duty express engine, which are summed up in the expression "sustained speed." Not the burst of speed which a little 18 by 24 in. engine occasionally makes over a level stretch, nor the rushing along of an "extra" with 3 or 4 cars, on a special schedule; but the speed that tells, the steady pull day after day, regardless of weather conditions or of extra cars, at a scheduled 50-mile gait, that can be forced 50% when there is lost time to make up. For such work steam is needed & lots of it, but every pound of water evaporated requires a certain quantity of coal, & every pound of coal burnt needs a certain

The weight on the driving wheels is not necessarily increased by the added heating surface, because the weight of the overhanging fire box is carried on the trailing wheels. These are equalized with the driving wheels, to give a smooth, easy motion when running at maximum speed.

If the tractive effort required exceeds the limit of adhesion which can properly be obtained from two pairs of driving wheels, the 10-wheel type should be selected, but it is not necessary nor desirable to use the 10-wheel type merely to obtain greater heating surface. By omitting the coupling rods to the rear wheels, thus reverting to the Atlantic type, better results can be obtained with less friction, & consequently less cost of maintenance.

The "Record" No. 20 contains illustrations of a number of notable Atlantic type locomotives, with the principal dimensions, for the purpose of affording a basis of comparison of the heating surface & weight on driving wheels in locomotives of the 8-wheel or American type & of the Atlantic type. Among those illustrated are two of the Atlantic type recently built for the Canada Atlantic for fast passenger service between Montreal & Ottawa.

The Freight Train of Life.

Men are like a train of cars
That rumble on the track.
With many curves and many jars.
And many drawing back.

Some are the engines that must pull
Upon the heavy grade.
And some are empty, some are full—
Each for its uses made.

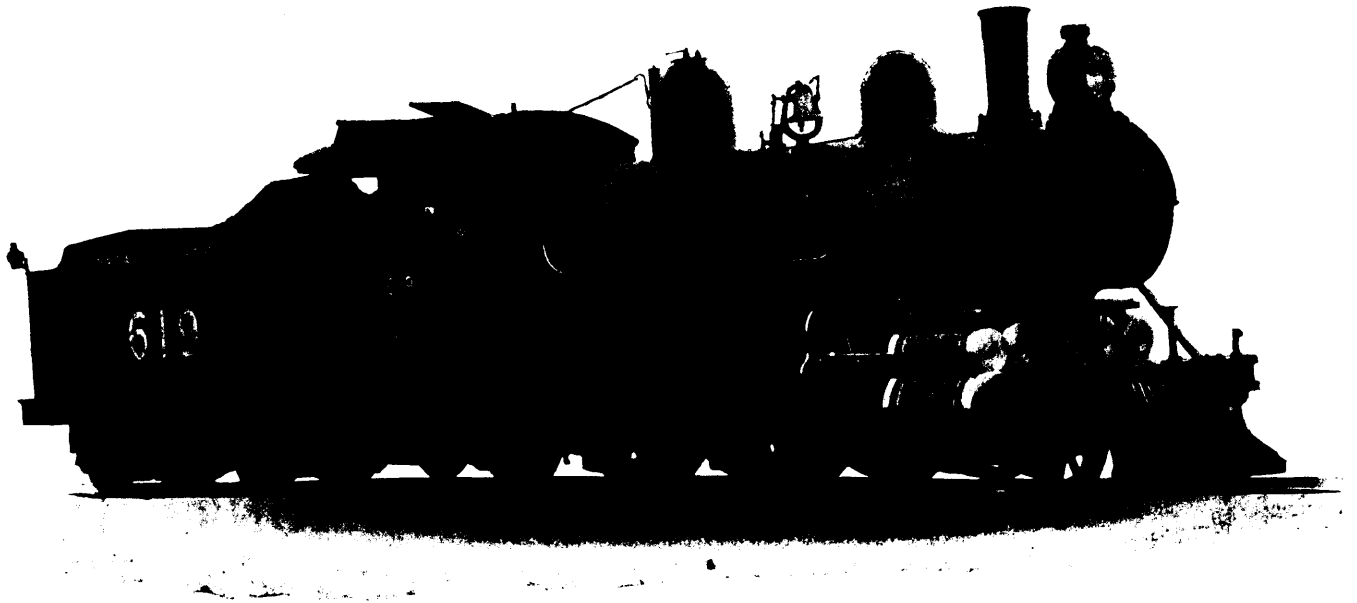
Some seem to slide along the way
With never a squeak or jolt.
And some go creaking, as if they
Were sore in every bolt.

And some are billed to go through straight.
And one is here and there,
To be left on some switch and wait
In gloomy days or fair.

Men are as cars that rumble past,
Each has its place and use;
The engine at the head, and, last,
The pitiful caboose.

S. E. KISER.

A movement is on foot among the employes of the C.P.R. & the G.T.R. which may lead to united representations among different classes of workers, with a view to the establishment of a fortnightly instead of a monthly pay day throughout the systems.



CANADA ATLANTIC RY. LOCOMOTIVE, BUILT BY THE BALDWIN LOCOMOTIVE WORKS.

amount of grate area, & thus the problem has resolved itself into two controlling elements: grate area, & muscle wherewith to supply the same with coal.

To maintain great speed high horse-power must be developed, requiring large heating surface & grate area, but for ordinary passenger traffic except on severe grades the adhesion usually necessary to move the train is not great. It is desirable, for the sake of the most perfect combustion, to have as deep a fire box as possible, & not to increase proportionately the weight on the driving wheels by the increase of the heating surface. These desirable features are obtained in the Atlantic type. The boiler can be made of a size suitable to give the required heating surface. A fire box of ample depth & grate area extends back of the two pairs of coupled wheels, the overhanging weight being supported by a single pair of trailing wheels. These trailing wheels are made smaller in diameter than the driving wheels, in order to give the maximum depth of fire box. The coupled wheels are placed as close together as possible, in order to give coupling rods of minimum length, & the boiler can be set as low as the proper clearance above the driving wheels will admit.

The Florida East Coast Ry., whose interests in Canada are looked after by W. A. Fletcher, Western Passenger Agent at Chicago, is sending out a lot of handsome advertising to ticket agents in Ontario & Quebec. In addition to attractive hangers & an hotel list & information folder, there is an album of views, containing over 30 beautiful half-tones of Florida scenery, which is one of the most superb pieces of railway advertising ever put out. The distribution is being made by the Railway & Steamship Folder Display Co., of Toronto, which means that it is being systematically done.

A contract is said to have been entered into between the Canada Atlantic & the Intercolonial railways for the carriage of Western grain to the seaboard at St. John N.B. The contract price is stated to be the same as to Boston, though the distance to St. John is a little longer.

A number of existing electric railway companies & a number of companies intending to apply for incorporation at the coming session of the Ontario Legislature will ask for exemption from the statute prohibiting the running of the cars on Sunday. These requests will be fought by the Lord's Day Alliance.

Among 600,000,000 passengers carried only 206 persons lost their lives on steamboat vessels within the jurisdiction of the U.S. during the last fiscal year, of which 44 were passengers & 162 members of the crews. During the same year there were 383 boiler explosions on land, which killed 298 persons & wounded 456 others.

The Michigan Central R.R. is testing the use of oil to lay the dust along its roadbed. Experiments are being made near Battle Creek, where a stretch of nine-mile track has been sprinkled. Crude petroleum is used at the rate of 1,800 galls. to the mile, the cost being about \$80 a mile. If these tests prove satisfactory next summer the entire roadbed will be kept dustless.

Track Inspection on the N. Y. Central.

By Axel Ames, Jr., Supervisor of Tracks, 2nd Sub-Div. N. Y. C. & H. R. R. R.

One does not need to have lived long enough to have acquired many grey hairs, to be aware, through his everyday observation, of the great changes which have within his

memory taken place in the transportation business of our country. It is a far cry in events & accomplishment from the stage coach & canal boat to the automobile & the Empire State Express; but the actual lapse of time covered by these tremendous changes is so comparatively slight that, although we take them as calmly as we do our breakfast or our newspaper, we know, if we stop to consider them, that we are daily beholding miracles. While America's natural resources are primarily responsible for her industrial greatness, it is safe to say that to her agriculture, manufactures & trade, the railway has been & is increasingly the most indispensable handmaid; & as witness that they have appreciated her services, there stands to-day our railway system, the greatest of the world.

Just as the shoemaker who started with his last & bench in his little shop 40 years ago has, in order to meet the increased demand for his wares & the competition which that demand has induced, been obliged to expand his small shop into a great factory with rapid & economical machinery; so has the railway, whose business is the manufacture & sale of transportation, had to increase its scope, enlarge its plant & introduce more wholesale methods of doing its business. As the demands put upon it have multiplied, it has been necessary for the railway to improve the tools with which it manufactures the transportation that it sells; & it is but natural that the most crying demand, namely, that for car capacity to carry the passengers & freight, should have first been met. It was quite as obvious that as it requires no more men to

handle a train that will carry 300 passengers than one that in the old days would have carried but 100, the carrying capacity of each train should have been increased. Also it is plain that it will require a more powerful engine to haul a lot of large cars than a few small ones, & it doesn't require a railway expert to demonstrate that if a locomotive pulls a train by the force of the adhesion of its driving wheels to the rail, you must double the amount of weight on those driving wheels if you wish to double their power of sticking to the rail & exerting their hauling force. Thus we see that the tendency has been continually toward increase in weight of trains, & one often wonders when the limit will be reached.

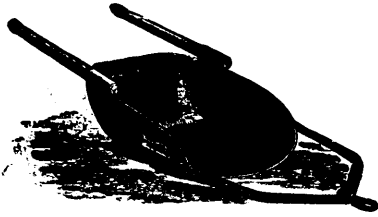
It is this great increase in the size & weight of engines & cars & of the loads that they carry, that has been the most noticeable feature of our railway progress, but right here is the point where the average man (& too often in the past, I fear, many a railway official) has stopped noticing. For the same reasons that one does not, while spending a pleasant evening in a luxuriously furnished house, concern himself with the quality of the masonry in its foundations; so most of those who ride in railway trains, though gratified perhaps by the comfortable furnishing of a passenger coach, seldom have a thought for the foundation of it all—that "court of last resort" in railway operating, the roadway & track.

In the building of American railroads widely different conditions have generally prevailed than in Europe, for while those of the latter country were built chiefly for the needs of an

existing population, and hence could be constructed in a substantial & enduring manner, our own have largely been projected in regions of sparse population, & under traffic conditions so uncertain, that only the smallest possible outlay & cheapest of construction were justifiable in the beginning. In a word, the European roads were built to supply an existing demand, while the American promoters had, in a large measure, to create the demand before supplying it. That the enormous business which their enterprise would develop was little realized by those whose capital & energies built our earlier lines, is strongly evidenced by the almost uniform failure, until within the last few years, of the track to keep pace with the traffic that it has been forced to carry. It is a fact, too little recognized in some quarters, that it has been only the vigilance & hard work of our maintenance of way officers, & their ability "to do with one dollar what any fool could do with two," that has in the past kept a good share of American roadbeds in a decently safe condition to run trains over.

But a new era has opened within the last 10 years. The profits from the earlier railway enterprises were so great that the temptation to build too many was too strong to be resisted, & the decade following the Civil War saw an abnormal increase in railway construction. It has required until the last dozen years for our increase in population & industrial development to bring about approximately those conditions under which the European roads were built. In other words, the country's railway mileage has caught up

WIRE ROPES, MARION STEAM SHOVELS, BALLAST UNLOADERS.



Columbus Pressed Bowl Wheel and Drag Scrapers.

.....Wheelbarrows, Picks, Shovels, Mattocks, Etc.

Contractors Rails and Dumping Cars.

Saddle Tank Locomotives.

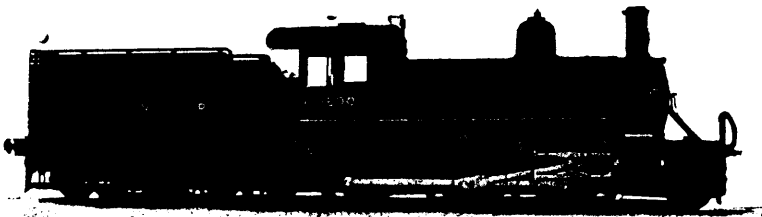
JAMES COOPER, 299 ST. JAMES ST., MONTREAL.

Established 1831.

Annual Capacity, 1,000.

BALDWIN LOCOMOTIVE WORKS.

SINGLE EXPANSION AND COMPOUND LOCOMOTIVES.



Built for the Great Northern Railway.

Broad and Narrow Gauge Locomotives; Mine and Furnace Locomotives; Compressed Air Locomotives; Steam Cars and Tramway Locomotives; Plantation Locomotives; Oil Burning Locomotives.

Adapted to every variety of service, and built accurately to gauges and templates after standard designs or to railroad companies' drawings. Like parts of different engines of same class perfectly interchangeable.

Electric Locomotives and Electric Car Trucks with Westinghouse Motors.

Burnham, Williams, & Co., - - Philadelphia, Pa., U.S.A.

Established 1849

CHAS. F. CLARK, Pres. JARED CHITTENDEN, Treas.

BRADSTREET'S

Capital and Surplus \$1,500,000

OFFICES THROUGHOUT THE CIVILIZED WORLD

EXECUTIVE OFFICES

NOS. 348 and 348 BROADWAY, N.Y. CITY, U.S.A.

THE BRADSTREET COMPANY gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying and promulgating information, no effort is spared, and no reasonable expense considered too great, that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished, and are available only by reputable wholesale, jobbing and manufacturing concerns, and by responsible and worthy financial, fiduciary and business corporations. Specific terms may be obtained by addressing the Company at any of its offices.

CORRESPONDENCE INVITED

OFFICES IN CANADA:

Halifax, N.S.	Hamilton, Ont.	London, Ont.
Montreal, Que.	Ottawa, Ont.	Quebec, Que.
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Victoria, B.C.		Winnipeg, Man.

THOS. C. IRVING,

Gen. Man. Western Canada, Toronto.

JOHN A. FULTON,

Gen. Man. Eastern Canada, Montreal.

with its growth in other directions, & our operating officers have at last found time to take breath & turn their attention toward putting their roads into condition, not simply to carry the traffic somehow, but to carry it economically. While the overbuilding of the past has caused a competition which has made strict economy necessary, most of our trunk lines have an assured traffic of such volume that they have been able of late years to appropriate enough money to give their track that solidity & permanency which, although involving considerable outlay at first, insure from future decreased cost of repair, a true saving in the long run. Poor track is altogether too expensive a luxury for railways to afford nowadays.

Suppose we have a track where some of the rails, through lack of proper attention, or through being too light for their load, are half an inch low at the joints. Every pound that rolls over those joints falls half an inch, & has to be lifted out of the depression; & when we note that the hundreds of tons that pass over these rails move at great speed we begin to appreciate the mightiness of the destructive forces at work. Consider, too, the shocks & oscillations that are caused to engines & cars by running over track that is uneven in surface or alignment, or which yields excessively either vertically or horizontally under their weight; & when discomfort to passengers, loss of speed, & liability to accident are added in, we find a total which rises up & demands a roadway that shall be as near perfection as possible, as regards safety, solidity & smoothness.

We can almost imagine what the various parts of some of this oldtime bad track—which, of course, does not exist on "our road" any more—might say if they were endowed with speech, & hear some poor old rail exclaim: "Scrap me, if here isn't another of those 'hogs' coming." Bang! & 20,000 lbs. hits him on his battered head.

"What did you let that fellow come on to me so hard for?" he demands of the angle bars that connect him to his neighbor.

"We can't help it," said the outside plate. "My mate is cracked in the middle, & these miserable bolts that are supposed to hold us together are so loose that we can't help you out any."

"You needn't blame us," objected the bolts. "That track-walker didn't half tighten us up this morning, & besides, we can't do everything. Why don't you lay it to the spikes?"

"Who's kicking about us?" asked a number of those rusty individuals. "Here our heads are most cut off by your old flange, & how do you expect us to keep snug against you in such rotten ties as these?"

The oldest tie took it upon himself to answer: "See here! I've been lying in this mud for six years, & I've been almost adzed in two on account of you fellows' loose ways. Besides, I'm only a red oak, & ought never to have been here at all. I'd done pretty well, though, if I had had good clean ballast under me."

"Well," said the rail, "I only hope that the next one of those fellows that goes over us will break a spring-hanger & have to lose half an hour getting blocked up."

It is to prevent all these previously described evil effects of bad track, to render impossible the recurrence of any such imaginary conversations as the foregoing, & to hold its engineering & maintenance-of-way officers & men to the high standards set for them, that the N. Y. C. & H. R. R. Co., in common with other large roads, has instituted & maintained its system of annual track inspection. The inspection this year was made between Oct. 15 & 20, & was the most thorough ever undertaken. Each division of the system is divided for maintenance-of-way purposes into from 2 to 4 sub-divisions, comprising from 150 to 200 miles of track, each being in charge of

a Supervisor of Tracks, who reports to the Division Engineer, & he in turn to the Chief Engineer, the latter being assisted by the Engineer of Track. The sub-divisions are composed of sections of varying length, some covering a yard, some as many as 6 miles of single-track main line, & each in charge of a section foreman, who has his force of track laborers. To all these foremen & supervisors the inspection is the great event of the year, as on its results depend not only their prestige with their superiors & associates, but dollars & cents; for excellence in riding qualities & appearance of the track under their charge are rewarded by substantial prizes. To the section foreman whose section is the best on the sub-division \$3 a month extra pay for the next year is awarded, & if he is so successful as to have the best on the division, this is increased to \$5 a month. The supervisor whose sub-division is the best on his division gets \$10 a month increase for the ensuing year, and should he achieve the distinction of having the best sub-division on the whole system his prize amounts to \$15 a month for 12 months.

The principal lines are inspected by the Chief Engineer, Engineer of Track, the Division Engineers, & by the supervisors on their divisions, but in marking the quality of the roadbed, no officer's marking is allowed to count while on his own territory. The branch lines are inspected by committees of supervisors from other divisions. For the inspection the party uses a special type of car, which has one end made as large as the bridges & tunnels will allow, & forming a great window behind which the inspecting committee sits on seats arranged in tiers. This car is pushed ahead of a locomotive, & an unobstructed view is thus obtained of each portion of the road as it is gone over. As each section is reached its number is called off & every inspector takes careful note of the alignment of the tracks, their surface, the drainage of the roadbed & its neatness, which latter includes adherence to the established standards of track work. As the practised eye of the track man glances along the roadway he can easily detect any irregularity in the alignment of a curve, any swing in a tangent, or sag, or too abrupt change in the surface of the track. He notes whether or not the ties are properly laid & spaced, whether the ditches are dug so as to carry off the water, the ballast clean, free from weeds, & dressed to proper shape, & the signs & crossings built & set according to established standard. He can tell from the oscillation or jolting of the moving car, whether or not the outer rail of a curve is properly elevated, detect any low joints, improper tamping of ties, or gauging of track. All these & many other defects are as apparent to him, if they are present, as dust on the furnishings of a room to the thrifty housewife. He records his observations on a blank form, using as his guide in grading the different sections the following table, which explains itself:

SYSTEM OF MARKING.

	Line.	Sur- face.	Drain- age.	Neat- ness.	
Perfect	30	30	20	20	100
Very good	25	25	17	17	84
Good	22	22	15	15	74
Fair	17	17	10	10	54
Poor	10	10	5	5	30
Bad	7	7	3	3	20
Dangerous	0	0	0	0	0

If a section of track were perfect in every respect, which of course never occurs, it would be marked 100; if it totals to 84, it must be very good track, & so on. These tabulated markings are all sent to the Chief Engineer's office, where they are averaged & consolidated, & everyone goes home to his division to await the announcement of the award, & to plan out his work to win next year "or bust." This inspection is supplemented later in the year, as a rule, by that

made by Dudley's Dynagraph car. It is to be hoped that the general public, as well as railway men will, ere long, realize what an important effect such a system of inspection as this, must have on the esprit de corps & efficiency of the force that works under it; & as they share in its good results, may they occasionally have a kindly thought for "the man with the pick."—Railroad Men.

The White Pass and Yukon Route.

By George H. Worcester.

After steaming about a thousand miles north from Puget Sound, during most of which trip friendly islands afford shelter from ocean's rude blasts, you awake one morning in the Lynn Canal, this designation having for some unknown reason been given to an arm of the sea projecting inland between high mountains. Rather than any canal familiar to us, the Suez, "Soo," Erie, or even the Mott Haven Canal, it much more resembles a Norwegian fjord or a somewhat enlarged edition of the dark Saguenay River. Farther along it forks into the Chilkat & Chilkoot Inlets, following the latter of which you come to other junction points, & finally a small one, each arm being really a kind of bay. At the head of these two termini stand what were but a couple of years or so ago rival towns, Dyea & Skagway. Behind each town is a pass over the mountains to the gold & mosquito infested lands beyond, Chilkoot Pass behind Dyea being on the shorter route, while White Pass behind Skagway, though the route is a trifle longer, is 600 ft. lower. Dyea rather had the bulge on her neighbor in business until the construction of the railway, which naturally selecting the pass of least elevation, began to make her, in spite of the aid of an aerial tramway, suffer from galloping dry rot. Several plans have been evolved on paper to build an opposition line through Chilkoot Pass, but so far they may all safely be characterized as wind. The papers also announce the construction of a line between Skagway & Dyea, a distance of four miles, in whose interest cannot well be ascertained. If it's part of the Chilkoot scheme it probably won't be built right away, while if in any other interest, it will be a knockout blow for it. In any event town lots in Dyea can be bought very cheap & seem likely in the not distant future to nearly be had for the asking.

The town Skagway strikes one as in a picturesque situation, lying in the foreground of the Skagway River's flat floored valley, whose sides rise almost vertically to hundreds of feet above; backed also by rugged, snow streaked mountain ranges, & with a sweep of circular foreshore in front. As an addendum, out in the Inlet the rock scenery is fine both in coloring & formation, & embellished with many a sparkling, translucent glacier. One of these showing beautiful tints of blue & green, caps a mountain across the Inlet right opposite the town, seemingly almost over it; a decoration of the skyward landscape that few burghs can boast of as so near, on tap from any street by merely raising the eyes. The naturally pretty circular sweep of the water front has been almost effaced by numerous wharves built out to deep water, which, as the tide rises & falls some 16 ft., are very high & several hundred feet long. At low tide is displayed a perfect forest of long, gaunt piles, hardly old enough yet to have acquired the seaweedy green fringes that solace their declining years.

Skagway is a country-built, wooden settlement, laid out in square blocks, with wooden sidewalks, dirt pavement, & a quantity of small buildings with these dreadful false fronts. One is at first somewhat surprised at the large size of it, comparatively speaking, which is changed to a feeling akin to admiration when the back part of town is reach-

ed, where the stumps, although razed off level, have not yet been pulled out of the streets. Their great number is the most convincing testimony possible as to what a job it must have been to tear down a thick forest & put up this town in its place. It is obvious that the railway has in a sense hurt the town, as is witnessed by the large number of buildings of all kinds to let. In the halcyon days of yore everybody had to tarry there a day or two to fit out or get pulled together for the trail. Now they take the first train & pass on without stopping. In the desire to levy some toll on passing business, common with all municipalities, the town is in a measure throwing several kinds of fits, even to the extent of publicly wishing itself Canadian in order that the customs bureau may be located there, & every passer through be necessarily held up awhile.

The railway in these yet almost primeval surroundings strikes one as odd, almost out of place, as perhaps a sort of exotic to be kept on ice, as it probably is - or under ice - a good part of the year. One track, narrow gauge, comes solitarily down the main street to the station at the water front, a comfortable wooden building with the general offices upstairs. It is very quiet about here except at train times. At this terminal they also handle barge freight by an arrangement that is unique. Out on the beach or foreshore runs a track that is submerged to the depth of several feet at high tide. Barges or scows loaded with freight are then floated in, & allowed to ground at low water, when cars are run out & the loading transferred to them or vice versa, all this necessitating some circumspection not to get caught by the rising tide. This barge transfer is chiefly by steamers, ex-

cept a small amount to Dyea, which will presumably disappear if the connecting line is built. Another branch for freight comes down under the cliffs at one side of the valley, & runs out to deep water where are several buildings. One or two engines switching here give some life to the scene.

The freight & passenger tracks unite at the yards back of the town. This is not a very large layout, consisting merely of a few round-house stalls, a small machine shop, & the inevitable crop of nondescript sheds that always flank such places. As the yards are surrounded by the pine forest which comes down to the back of the town, the whole place has a savor of Lonelyville, an out-in-the-woods look. The valley is filled with this forest, except where occupied by the much-sprawled-out Skagway River, which, as the valley floor rises, tears rapidly along down with considerable noise over its masses of boulders & pebbles. Whether to ease the grade or because it has to hunt for room, the railway crosses the river & then back again, both times on home-made bridges of wooden beams & iron braces, over both of which, ominous sign, the train slows down to a walk. Bridges & trestles, some of the latter quite large ones, are fairly numerous along the line & all of wood. The trains are not slowed over the rest of them, though full speed is not excessively fast.

At the back end of the valley, which appears to terminate rather suddenly, the line swings around 180° & comes back on the left or northwest side, now well elevated above the floor, so that one can look over the town out into the Inlet. At an opening scarcely before observed, where a stream emerges, the line swings out of the original valley high

over a canyon of surprising depth & the sides of which are very straight up & down. The rocks here & in several other places, designated all by new made names, such as Rocky Point, Porcupine Cliffs, etc., are peculiarly smooth & bare, so that during blasting for construction, the workmen had to be let down by ropes from above. By the use of modern methods some phenomenal masses of mountain side were tumbled down at one fell swoop during construction. All the rest of the trip till just a little bit off from the top, the line is as a rule pretty well aloft, so that from the left hand windows you can gaze down into deep canyons or open valleys, while from the right hand ones is an excellent opportunity to study geology, the vertical rocks of the inside of the shelf on which the line generally rests being but about 2 ft. distant. The location of the line along the sides of deep valleys is undoubtedly a fine piece of engineering, & in places where it runs up a side gulch or valley to gain altitude, & you can see the returning portion high above on the opposite slope, carried along on trestles & bridges over slanting or almost perpendicular gullies in the mountain side, it quite impresses one.

The entire length of the line except near the top has been partially spoiled in a scenic sense by the too common practice of letting the timber get on fire. This arises from sheer wantonness in the construction camps, where they won't take the trouble to extinguish the fires used for cooking, etc., which communicates to the adjacent brush or timber. This may burn for days, running clear up to the timber line & spreading more or less over the surrounding country, according to the wind, weather & conformation of the land. Instead of the beautiful green this leaves be-

C. P. R. LANDS.

The Canadian Pacific Railway lands consist of the odd-numbered sections along the Main Line and Branches, and in Northern Alberta and the Lake Dauphin District. The Railway Lands are for sale at the various agencies of the company in Manitoba and the North-West Territories at the following prices:

Lands in the Province of Manitoba average \$3 to \$6 an acre.

Lands in Assiniboia, east of the 3rd meridian, average \$3 to \$4 an acre.

Lands west of the 3rd meridian, including the Calgary District, generally \$3 per acre.

Lands in Northern Alberta and the Lake Dauphin District, \$3 per acre.

TERMS OF PAYMENT.

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 remainder annually thereafter, except in the case of the settler who goes into actual residence on the land and breaks up at least one-sixteenth thereof within one year, who is entitled to have second instalment deferred for two years from date of purchase.

The following table shows the amount of the annual instalments on a quarter section of 160 acres at different prices:

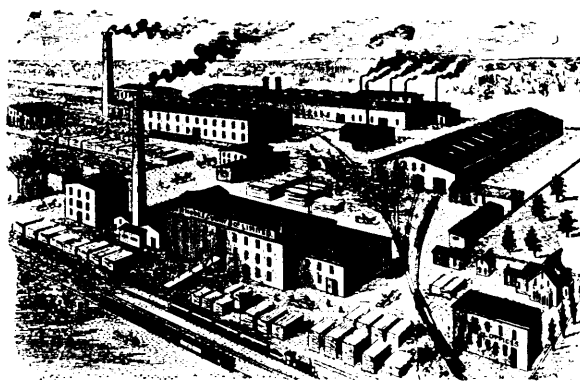
160 acres at \$3.00 per acre, 1st instalment \$71.90, and nine equal instalments of \$60.
160 acres at \$3.50 per acre, 1st instalment \$83.90, and nine equal instalments of \$70.
160 acres at \$4.00 per acre, 1st instalment \$95.85, and nine equal instalments of \$80.
160 acres at \$4.50 per acre, 1st 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.

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.

Write for maps and full particulars.

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Burlington Elevator, St. Louis, Mo.	Capacity	1,300,000 Bushels
Grand Trunk Elevator, Portland, Me.	1,000,000 "
Export Elevator, Buffalo, N.Y.	.....	1,000,000 "
J. R. Booth Elevator, Depot Harbor, Ontario	.....	500,000 "
Cleveland Elevator Company's Elevator, Cleveland, O.	.....	1,000,000 "
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.	.....	600,000 "
Northern Grain Co., Manitowoc, Wis.	1,350,000 "
Union Elevator, East St. Louis, Ill.	1,100,000 "
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PLANS AND SPECIFICATIONS.

hind acres of tall, gaunt, blackened stumps, or an inextricable mess of charred, shapeless fallen timber, neither sight conducive to beauty in the landscape.

The old trail can be seen below, generally in the bottom of the valley, except where forced up the slopes by the stream, or where it has to climb to pass above canyons. Now that it is little used it seems in excellent shape, & so little dangerous that the numerous tales of pack animals, chiefly horses, falling out of it seem almost chimerical. When all this took place, however, it was not the present level, comparatively broad & easy path, but a mere trail as worn out by the continuous tramp of human & quadrupedal feet, full of lumps, bumps, rocks & slides, & of sudden ups & downs as the price of wheat. A Seattle man who was there during the rush days told the writer that he had himself at one time counted as high as 500 animals below the trail between Skagway & the summit. Many of these had not fallen off themselves, but getting played out had been dumped off to clear the track. One of the spots where the greatest number tumbled was simply on a steep hillside, not so very high above the valley floor, but where some streams coming down soaked the whole ground more or less, making the trail very slippery. With their prospecting packs it was not a hard matter for the poor beasts to lose their equilibrium & fall.

In the floor of the valley well on towards the summit is a spot easily recognizable by the cleared state of the ground, the deposits of tin pans, broken wood & other debris, as the former haunt of civilization, now represented by, perhaps, a couple of tents only. Here was formerly White City, so called from its having consisted almost entirely of the tents of those in transit over the pass, as it was the last broad open space before the trail mounted rather steeply to the summit. The railway proved its boojum snark, & it has faded away & disappeared.

Near the summit the line runs up a lateral gulch, where it's too narrow to curve around, & the line makes a switch-back—not a convenient thing to have in the main track—from which point on those who had but rocks to contemplate before now get a view out into the world. A tank, &, of course, a turn-table, are here, the latter housed-in, a reminder that the "beautiful" must abound in winter. Before attaining the top one gets some fine peeps back over intervening hills on to the Inlet, several miles distant & some 2,500 ft. below, which has that beautiful deep turquoise blue color found on lakes setting low among high hills.

Arrived at the summit, where one rather expects a view off in the other direction, there is disappointment, as the pass or valley through which the line passes is quite shut in by higher hills. The summit lake, much resembling a section of river, begins here, & winding out of sight, is $7\frac{1}{2}$ miles long, so the railway runs that distance on the level before commencing the slight descent towards Lake Bennett. The boundary line between Alaska & Canada is pointed out behind the group of station buildings, where a rope is stretched thwartship the scene. While the rope is there it would be unsafe to gamble that it were the exact boundary. Rather more, it is gotten up for trotters on the well-known supposed principle that everyone who comes from somewhere else is a sucker. The station building proper is over in Canada at the head of the lake. Some other small shanties are called customs houses, & the usual collection of shacks, car bodies, etc., are planted about on the rocks. Standing some feet apart, & between which runs the supposed boundary, are the British & U.S. flags side by side. Under them & somewhat back is a heap of stones on which is a favorite spot for globe-trotters to get photographed with both en-

signs showing in the picture. Some of the Canadian Northwest Mounted Police are standing about in khaki uniforms, with broad felt hats with four dents in the crown, every one looking like the pictures of "B.-P." so numerous published after the relief of Mafeking. There is a sergeant's guard of "culled" troops below in Skagway, but none of them seem to be stationed at the summit, as they would make bad feng shui in the landscape.

The series of lakes & connecting rivers uniting to form the Lewes River (which subsequently uniting with the Pelly forms the Yukon) is well known from multitudinous published articles. Beyond the summit the line cuts across country, skirts Lake Bennett & ends at present at White Horse on Fifty Mile River (connecting Lakes Marsh & Labarge) 112 miles from Skagway, to which point it was opened at the close of last July. This terminal is just beyond White Horse Rapids & Miles Canyon, so that navigation from there on is unobstructed, except a rock at Five Finger Rapids near the Yukon, which the Canadian Government is now removing. The ultimate intention is to carry the road to Fort Selkirk at the head of the Yukon, 383 miles from Skagway, but whether it is going on to Dawson, 176 miles farther, deponent sayeth not. As the line crosses several boundaries—Alaska & two Canadian provinces—it is made up of several corporations; the Pacific & Arctic Ry. & Navigation Co.; the British Columbia Yukon Ry. Co.; the British Yukon Miners' Trading & Transportation Co. (now curtailed to British Yukon Ry. Co.), as well as some minor ones, all of which are operated under the name of the White Pass & Yukon Route.

They at present run 2 passenger trains a day each way, averaging about 4 hours north bound & $3\frac{1}{2}$ south for the 112 miles. Obviously there is no use of hurrying, & they don't. The freight business seems to be heavy enough to have caused several blockades, not of cars, as the amount of rolling stock is both somewhat limited & fixed, but of the freight itself, chiefly at White Horse, from which fact the blockade is probably due to lack of facilities. The not very large freight trains have the odd look due to a lot of cars all of the same pattern & markings, instead of the diversification found with us. With scarcely any of night's darkness in June, the culminating point of a superfluity of daylight, it is not so bad railroading there throughout the summer. But with the heavy rains & drifting snows of winter, with the Arctic cold & winter darkness, it must seem a desponding story about Christmas time.

The rates on this route are of a tallness that quickly convinces the dear public that the management are not there for their health. As a fact, en passant, most of the officers live in the U.S., even as far away as Chicago, only a portion of the operating staff facing the woes of darkest winter in this far from home land. The local passenger rates are about 25c. a mile, thus making the fare to the summit (21 miles) & return \$10. It is the custom when the summer tourist steamers touch at Skagway to give a half rate (\$5) for an excursion to the summit for a guaranteed 50 tickets. On the steamer on which was the writer, 106 excursionists turned out, so the company netted practically \$530 for the use of an engine & 3 cars for 42 miles. As a compensation for the somewhat stiff price, each excursionist was presented with a wealth of paper for his ticket, which consisted of 2 coupons, & a souvenir portion on which the road was boldly dubbed "the scenic line of the world." For longer distances the rate comes down a bit, as the fare to White Horse, 112 miles, is \$20, averaging about 18c. While the writer did not hunt up freight rates, it is fair to presume that they correspond to a considerable extent with the scenery, which is mountainous. It is quite a common practice

for owners of live stock to drive over the trail rather than pay freight charges.

They sell through tickets to Dawson & Cape Nome via the Yukon, & for that matter you can buy round-trip tickets from any Pacific coast port to the Klondike or Cape Nome via this route & return direct by steamer. The Canadian Development Co., a protegee of this line on the Yukon, has 9 steamers of small size averaging room for say 150 passengers & 75 to 200 tons of freight, & the railway company has traffic arrangements with several others. There are also numerous independent boats, & some people say that better time can be made by buying local tickets, thus enabling one to take the first steamer that departs, rather than be tied up waiting perhaps for one of the Co.'s vessels, on which alone of course the through tickets are good, & which do not always connect with the trains. From all accounts one must get insured before trying the independent steamers, as they (of not very rugged constitution possibly in the first place) sometimes take great chances in cutting off corners, etc., to make time, & accidents are by no means unknown. Recently while trying to turn a short corner one turned over & several people were drowned or hurt. A severe rate war was on between the Co.'s steamers & the independents, by which the original fare of \$80 between Dawson & White Horse had been cut to \$40 up-stream & \$30 down by the Co., while the opposition went as low as \$15. The latter price, as it included beds & meals—such as they were—was low enough for the 447 miles, provided you reached your destination. The latest reports, however, relate that a truce has been patched up & rates raised somewhat.

This route uses time one hour slower than Pacific time, Skagway being roughly about $12\frac{1}{2}^{\circ}$ (15° equal one hour's difference in time) west of San Francisco. The writer should have ascertained the name of this time, but didn't. However, any old name—Alaska, Klondike or Yukon time, as it does not strike any other land south—would do, & probably one of these names is used.

The rolling stock is all of the customary types of narrow gauge equipment. The coaches are of stock pattern found everywhere, chiefly reprehensible for the sliding window-blinds which cut off any upward view. Luckily, on this route all the scenery is below. Narrow gauge coaches are generally rather tucked-up & teetery on their springs, & these are no exception. As a goodly portion of the community in this region are free & easy in their methods of life, such as continually wearing a quid of tobacco in the cheek with the consequent expectoration, & are not too fine-haired about the spotlessness of their surroundings, they do not expect too clean accommodations when traveling, & the state of neatness of the coaches is allowed to be in rapport with these views of unembarrassed unconventionality. There are also some special corridor cars consisting of flat cars with plank seats & decked over with a roof. The unupholstered seats run across the car leaving the passageway on one side, the whole surrounded by a practicable fence. These are used for excursion business, as they allow an unrestricted view below & aloft. All the equipment has link & pin coupler. Of locomotives they have several diamond stack, 4-wheelers & some Baldwin consolidation compounds with frames outside drivers. The dimensions of the latter are:

Weight on drivers	.....	80,000 lbs.
total	.....	89,500 lbs.
Drivers, diameter	.....	38 in.
Cylinders	.....	11½ in. and 19 in. x 20 in.
Steam pressure	.....	200 lbs.
Boiler, diameter	.....	65.38 sq. ft.
120 tubes	.....	2½ in. in diam.
Heating surface, tubes	.....	1,069.81 sq. ft.
" fire box	.....	65.38 sq. ft.
" total	.....	1,135.19 sq. ft.
Grate area	.....	15.7 sq. ft.
Capacity tank	.....	3,000 gals.

Whether owing to their isolated position or not—that is, from machine shops of large capacity—their motive power appeared to be in somewhat dubious shape at the time of the writer's visit. Our high-priced excursion had to wait some time for an engine, & when it came it was a Vauclain compound with a broken L. P. cylinder, so we made the trip with one side only. Luckily it was a consolidation.

The location of this line is apt to strike one as pretty far north, as from the northwest corner of the U.S. one steams about 1,000 miles further north, creating the impression that one must then be pretty well up toward the Arctic regions. But although one could cut ice up at Skagway & thereabouts, at least during a considerable portion of the year, this would be a much less ice cutting location both literally & metaphorically on the other side of the world. Skagway is in about the same latitude as St. Petersburg & Christiania, so some of Russia's railways, including the entire system of Finland & the line to Archangel on the White Sea, as well as half of Sweden's & four-fifths of Norway's systems, are north of this point. The systems of the two latter countries extend generally about three hundred miles north of Skagway's latitude, with detached bits further north, topping off with a line from the Gulf of Bothnia across to the ocean that is partially within the Arctic circle.—Railroad Men.

A Sketch of Sir Wm. Van Horne.

H. R. Lewis contributes to Ainslee's Magazine an interesting sketch of the Chairman of the C.P.R. Co.'s board. The writer of the sketch takes his readers to a scene in the heart of the Rockies while the C.P.R. was still under construction, where the General Manager's makeshift private car was an object of awe & reverence to the army of Siwash & Chinese railway laborers, summoned from far & near in anticipation of a catastrophe.

Rising winds & the melting snows of spring had revived a score of mountain streamlets, changing them almost in a breath from purling brooks to menacing torrents, & causing them to bear impetuously toward a certain locality given on the map as Stoney Creek.

It was here in the very heart of the Rockies that the giant trestle of the new road had stretched its wooden legs across from bank to bank like some great spider. And it was because of the fear that the costly framework, which formed a necessary link between two important sections of the road then building, would be imperilled by the rising waters, that armies of laborers had been moved by night, that officials of every degree, & that even he, known familiarly as the "old man," hastened on foot, on construction trains & by private car to the scene.

The work, the hurry, the bustle of these pigmies with their rough costumes, rougher speech & queer machines, were strangely out of place in this spot. The silent mountains

closed in about them as if to hide their iconoclastic work. Interminable stretches of snow & ice glinted above them. Forests of pine & spruce & masses of hardy brush carpeted the lower levels of the great canyon. Gusts of wind sweeping down from above sent the smoke of the locomotives swirling in arabesques.

There were men felling trees & men drafting great logs, men building trestles & braces & wooden bulwarks, men laboring to the utmost of their physical powers & men directing their labors, & one man there was, sturdy, plainly dressed & calm of bearing, who directed the directors. He seemed to be everywhere, giving his personal attention to each detail of the work. He found the spots claiming immediate attention & measured accurately with his eyes the speed of the rising waters.

He superintended the unloading of rock brought by puffing engines & assisted with his own hands in placing the heavy blocks of stone. He told the carpenters how to secure the huge wooden braces, the smiths where to fasten their iron clamps & with it all never lost for one moment his cool, authoritative demeanor.

All through the day he drove the men & drove himself, & when the light of the fading sun vanished beyond the western peaks, he saw that the bridge was saved.

The Chinese laborers & the Siwash construction hands limped slowly to their little camps built here & there in the crevices, & along the ledge wrought for the tracks. As the shadows darkened into night, the General Manager made a final tour of inspection & withdrew, soiled & worn, to his car.

A few moments later the groups of tired men huddled about the camp-fire heard a strain of music mingling with the voice of the torrent, & the sigh of the winds in the pines. They exchanged wondering glances, & asked one another the cause of the unexpected melody. They got up to find out. Presently the Siwash & the Chinese, the foremen & the skilled mechanics were standing at a respectful distance from the private car, gazing wonderingly through a window, at a toil-stained man seated just within. Tucked under the bearded chin was a violin; a bow, grasped tenderly by a hand still bearing the stain of work, passed slowly across the strings. An aria from Gounod floated out into the night.

"Say, fellows, it's Van Horne himself," commented one of a trio of engineers in the group surrounding the car.

"Yes, & it's a sign that he's satisfied with the day's work," replied another. "The old man plays that trembly sort of a piece when he's pleased, & he plays it like he works, & like he paints pictures, & like he manages men—a little better than any one else on this here earth."

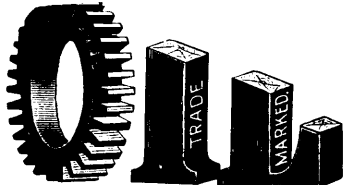
In February, 1843, a boy was born in the Van Horne family, then living in a small cross roads settlement, called Chelsea, 14 miles from Chicago. The farmer was a law-

yer of some local repute, but failing fortune compelled his son William to enter the service of a farmer at an early age. William hoed potatoes & curried horses, & is said to have done both very badly indeed. He was as a lad a dreamer of dreams & a seer of visions. He read every book he could lay his hands upon, & drew crude maps of engines & of ships. One day he took up the study of telegraphy. It was an inspiration, one of those trifling acts in a man's career which sometimes forms the turning point in his career.

Wm. Van Horne soon withdrew from the farm & entered the service of the Illinois Central as a cub telegraph operator. This was when the road was under the management of General McClellan & Ackerman, & other

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D. Douglas, Proprietor. Rooms en suite with baths and all modern conveniences. Rates 22 to 24 a day. Special rates for families and large parties, according to accommodation and length of time. Though moderate in price the Leland is first-class in every respect. It is especially adapted to please the commercial trade. It is in the centre of the wholesale and retail district. It is in direct communication with all parts of the city by car lines. It is supplied with the purest spring water from flowing well on the premises.

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HOISTS,
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Simplest,
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Most Effective.

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FACTORY, - MOREAU ST.

early-day managers. The new operator received \$40 a month, a munificent salary for a boy whose only training had been bounded by the rail fences of an Illinois farm. It is said of him in those days:

"He learned to fiddle a little & drum a piano, & having a talent for drawing, he began to cultivate art. He once drew a caricature of Gen. McClellan on the brown painted side of his telegraph station on the Illinois Central, which came near costing him his place. The picture represented the General in full regimentals, but in a dangerously undignified attitude."

This was but the exuberance of the boy; he had not seen then the scope of the world, or realized what it had in store for him. The position of operator was the first step in a railway career destined to prove remarkable. It was the first round in a ladder of uninterrupted success, a ladder covering the gamut of railway positions, & ending in the absolute control of the C.P.R., the greatest railway system on earth, & in a British knighthood.

Mr. Van Horne's earlier years after his operator's experience were spent in & about Chicago. He filled scores of positions, each better than the other, until about 1879, when he was appointed General Superintendent of the Chicago, Milwaukee & St. Paul. His big brain, his intense personality, his tremendous energy, & his ready grasp of every railway problem, made him even then a conspicuous figure among railway men. It probably would have been better for the U.S. roads if Mr. Van Horne had remained on that side of the line. Certain it is that he could not but have added to the progress of any undertaking with which he might have been connected.

It was not to be, however. That same hand of fate which had lifted him from the farm to the telegraph office, & from the telegraph office through various stages to the general superintendency of an important road, was about to carry him into another country, & to a work destined to form one of the most conspicuous chapters in the world's railway history.

While Mr. Van Horne was overseeing the welfare of the St. Paul road, events of future importance to him were unfolding north of the boundary line between Canada & the U.S.

It is a common remark up there to-day that Sir Wm. Van Horne is the C.P.R., & the Canadian Pacific is Canada. Yet when the wonderful railway was first projected, Sir William had not been thought of in its connection.

A railway from the Atlantic to the Pacific, all the way on British soil, had been the subject of discussion & planning for almost half a century. In 1867, on the Confederation of the British North American Provinces, its realization was found to be a political necessity. With the newly-formed union came a renewed envy, if it might be so termed, of the prosperity of its southern neighbor, the U.S.; & there was an almost unanimous belief that a trans-continental railway was necessary to the well-being & the growth of the country.

In 1875 the Canadian Government set about

The early difficulties in connection with the construction of the line are well known. The C.P.R. Co. took hold of the project in the spring of 1881 & before the end of the year 163 miles had been built on the prairie westward from Winnipeg. It is needless to recapitulate the story of the opposition, secret & open, at home & abroad, which the undertaking encountered. It was declared that the formidable obstacle along the north shore of Lake Superior could not be overcome in twice the ten years stipulated as the time within which the line was to be completed. It was asserted that the north shore section

would never be built, because, they felt assured, other routes would in the meantime have come into being, rendering the construction around Lake Superior unnecessary. There was indecision & hesitancy, delay & bickering, & then a man stepped into the breach.

A month or two earlier a new incumbent had been secured for the position of General Manager of the road. The need for a practical railway man had caused the projectors of the Co. to look about them, & they finally offered the position to the then General Superintendent of the Chicago, Milwaukee, & St. Paul Ry.—W. C. Van Horne.

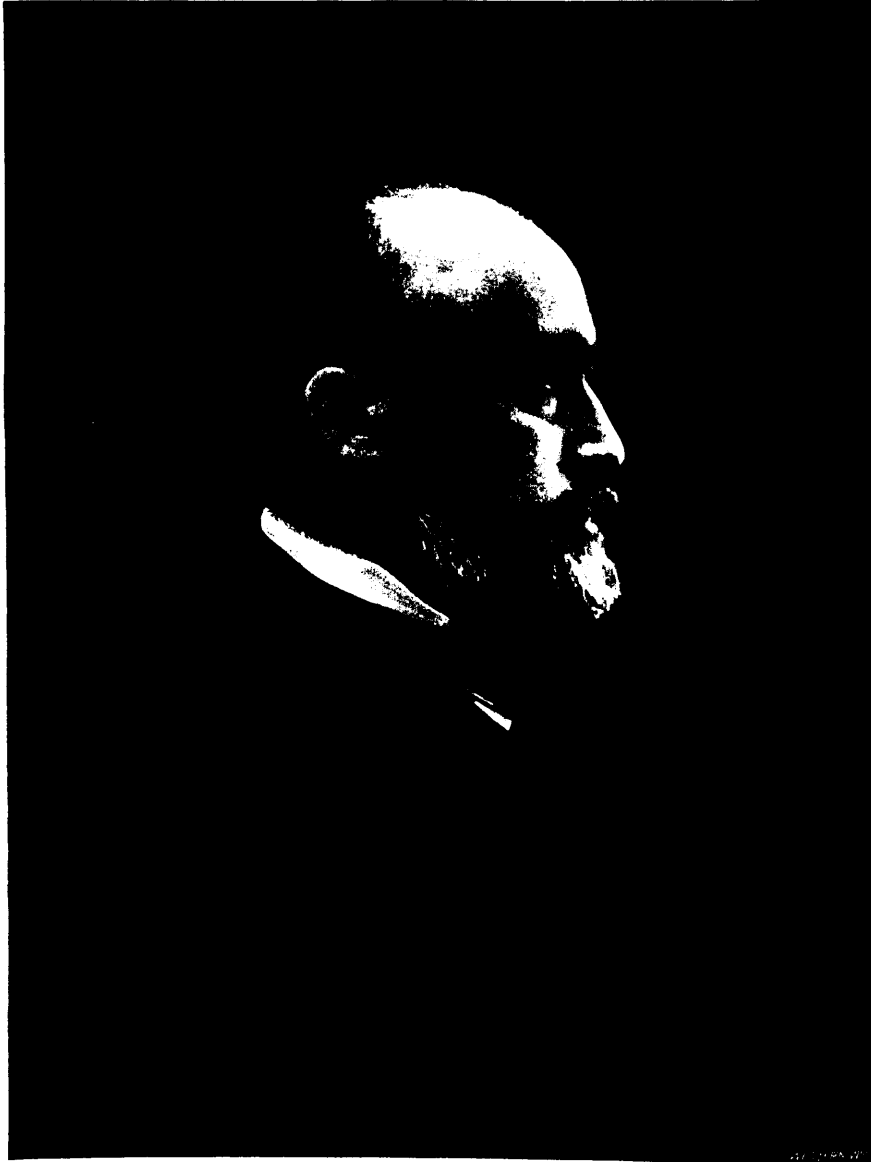
This was an important step, as it really meant failure or success to the Co. The compliment thus paid to the U.S. railway man, who, starting in life on a farm, had worked his way up to a position high in railway circles, cannot be overestimated. It practically meant saying to this son of Illinois, this foreigner, "Here, we have reached our last ditch. Our future depends upon you. Now, save us if you can."

Students of latter-day Canadian history like to dwell upon this part of the C. P. R. story. To them it means an epic of individual prowess, the warfare of a strong man—strong mentally & physically—against almost insurmountable obstacles.

Within a few weeks of his appointment, Mr. Van Horne made his

presence felt. When the enemies of the road began to decry the building of the north shore section—that along the upper end of Lake Superior—Van Horne promptly advocated the retention of the original plan, & insisted that an all-Canadian line was absolutely necessary. His opinions, backed by the extraordinary influence he had already commenced to exercise over his associates, were accepted & he plunged into the work with all the strength of his iron nature. His first task was to attack the wilderness on the north of Lake Superior.

Twelve thousand railroad navvies, & from



SIR WILLIAM C. VAN HORNE, K.C.M.G.
Chairman of the Board, Canadian Pacific Railway Co.

the building of the C.P.R., a task of such vast moment that the richest empire of Europe might well have hesitated before entering upon it. Previous railway construction had been child's play compared with this project which proposed venturing with bands of steel into regions hitherto unexplored, & lying in a country certain to offer formidable obstacles. Toward the east, all about Lake Superior & beyond to Red River, was a vast rocky region where nature in her younger days had run riot, & where deep lakes & mighty rivers in every direction opposed the progress of the engineers.

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- 8.—**A Burial Benefit** of \$100 at death of a Pensioner.
- 9.—**A Funeral Benefit** of \$50 at death of a member enrolled in Sick and Funeral Benefit Department.
- 10.—**Social and Fraternal Privileges** of the Court Room.

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Year.	Total Membership.	Benefits Paid.	Total Surplus.	Surplus per Capita.	Death Rate per 1,000.
1881	1,019	\$ 1,300 00	\$ 4,568 55	\$ 4 48	4.50
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	6.13
1889	17,349	116,787 82	188,130 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	70,055	511,162 30	1,187,225 11	16 94	5.47
1895	86,521	685,000 18	1,560,733 46	18 03	5.67
1896	102,838	820,941 91	2,015,484 38	19 60	5.56
1897	124,685	992,225 60	2,558,832 78	20 52	5.66
1898	144,000	1,170,125 14	3,186,370 36	22 12	5.67
1899	163,610	1,430,200 33	3,778,543 58	23 09	6.30

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Or Any Officer or Member of the Order.

1,500 to 2,000 teams of horses were set to work, involving the use of a dozen steamers for the transport of material & provisions. It was a small army in number, but its motive, creation instead of extinction, made its work of wonderful interest. The problem boldly faced by the new General Manager was one calculated to daunt the most venturesome & daring spirit. In his preliminary & personal survey he had found what he afterwards characterized as "200 miles of engineering impossibilities."

The country it was necessary to cross was a waste of forest, rock & muskeg, out of which almost every mile of road was hewn, blasted, or filled up, & in places the filling up of muskegs proved to be a most difficult task.

There were moments during the work when even Van Horne's stout heart almost failed him. Discouraging reports from surveyors & engineers, the discovery of unexpected obstacles, & the varied phases of weather, rain following cold & floods following rain, made the task hard beyond the comprehension of ordinary men. But there was that in the old Dutch stock of the Van Hornes & perchance in the American spirit of the Illinois-born man, which caused him to hammer away at the problem until he finally succeeded. It is well to say in passing, that if Van Horne had accomplished nothing else, his victory over the engineering difficulties afforded by the line along Lake Superior's north shore would give him fame enough for one man.

While the work of constructing the Lake Superior north coast line was progressing, other portions of the great system were receiving the attention of the tireless General Manager & his assistants. To those who have travelled over the C.P.R. from Montreal to Vancouver, the feat of building a railway under such conditions & through such a marvellous country is past understanding. The obstacles presented along the north shore fade into insignificance when compared with those encountered after entering the majestic Rockies. Practically every foot of the mountain division of the road was contested & probably every mile of tunnel & track was sealed with the blood of man.

The bridging of fathomless chasms & the piercing of many mountains were accomplished only after herculean labor & much suffering physically. There are bridges in this mountain division that hang in air—mere spider webs of iron—300 feet & odd above the river they span. There are places where masonry is plastered against the solid rock of the mountains. There are ledges midway between heaven & earth, & elevations where the whirling trains plunge headlong into clouds & deep, cool ravines, where the road-bed disputes with the darkness, the realm of mysterious mountain torrents.

There are miles of tunnels, & bridges without number. On the mountain division alone the exigencies of the winter season compelled the construction company to build 32 miles of snow-shed, & that at the enormous cost of \$64 a lineal foot. Over \$10,000,000 expended as a preliminary precaution against snow!

Small wonder that the Queen honored the man who faced all these problems & was daring enough to undertake such a colossal task, with a knighthood of the distinguished order of St. Michael & St. George!

While the mountain division was being carried through, the government contractors had finished certain other portions of the road, enabling the company of which Mr. Van Horne was General Manager, to take possession in conformity with the terms of the contract, & to connect the Pacific portion of the line with that coming from the East.

Finally, one rainy day, Nov. 7, 1885, a party assembled at Craigellachie, a short distance west of the Columbia River & one of them, Sir Donald A. Smith, drove the last

spike of the connecting rail, thus establishing a railway from ocean to ocean within Canadian territory.

That picturesque ceremony was of unbounded interest to the American people for two reasons. First, because it meant the completion of a railway destined to become a formidable factor in the carrying trade of the North American continent; secondly, because, assisting in the ceremony, was a man of their own kind, who, with his own brains & with his own hands had added to the list of great human achievements one of enormous & far-reaching proportions.

In the history of great enterprises the work itself must always take second place. Human interest lies in the man or men who planned & accomplished the work. It has already been said in this article that Sir Wm. Van Horne could rest his fame solely upon the building of the C.P.R. But he is more than a general manager, or a president, or a railway builder. He has been compared to Cecil Rhodes from the standpoint of marvellous versatility. He is an artist of undoubted ability & a connoisseur in music. He reads Spanish, Italian & Japanese with facility, & has made an exhaustive study of the art, history & literature of Japan. His interest in the latter country has caused him to undertake an extended history of Japanese art which will be published in many volumes, illustrated in color by Sir William himself, with sketches of all the exquisite gems in his own collection.

In his palatial home in Montreal Sir William has a magnificent collection of paintings, ancient & modern. The Dutch seventeenth century school is largely in evidence, while modern French, English & Spanish are represented. In addition to the engrossing cares of a railroad magnate, having under his supervision a gigantic corporation valued at \$200,000,000, Sir William has found time to become a prosperous amateur farmer in two provinces, & to cultivate special species of mushrooms. To-day he is still comparatively young—only 57 years of age—and from all appearances he has barely commenced to employ his talents.

Staff Register on the C. P. R.

The Second Vice-President and General Manager has issued a circular from which the following are extracts:—

A complete staff register, to include the following classes of employes, will hereafter be kept in this office:—

Agents, station, ticket,	Hostlers,
passenger, freight,	Inspectors—car &
& other,	other,
Baggagemasters,	Linemen, telegraph,
Baggagemen—station	Master mechanics,
& train,	Master mechanics'
Brakemen,	assistants,
Call boys,	Operators,
Car sealers, markers &	Photographers,
carders,	Policemen,
Checkers—car &	Porters—sleeping &
freight,	parlor car,
Clerks,	Pumpmen,
Conductors,	Repairers—car &
Despatchers, train,	other,
Doctors,	Roadmasters,
Engineers—civil, loco-	Signalmen,
motive & other,	Storekeepers,
Elevator men,	Storemen,
Firemen,	Switchmen,
Foremen—shop, sec-	Tankmen,
tion, locomotive, car	Timekeepers,
& other,	Watchmen,
Flagmen,	Weighmen,
Fuelmen,	Wipers,
Gardeners,	Yardmasters,
Gatemen,	Yardmen,
Accounting department staff.	
Bridge & building department,	
engine house men—all classes, with the exception of ordinary laborers.	

Hotels—clerical staff, housekeepers, stewards, head waiters, chefs.

Dining car crews.

Pacific steamships, lake steamers, Columbia & Kootenay steamers, Windsor ferries—officers.

To inaugurate this register it is necessary that the record of each employe, in the classes above mentioned, since entering the Co's service, should be obtained. A form has been prepared for this purpose, & the head of each department must arrange to have such filled up by those employed under him, & sent to this office at the earliest possible date.

Commencing Jan. 1, 1901, all employes then in the service of the Co., unless specially engaged otherwise, will be considered as on the permanent staff. Thereafter all new hands employed, unless otherwise specially arranged, will be considered as on the temporary staff, & will not be transferred to the permanent staff until after six months' continuous service, & then only in the event of satisfactory service & on the recommendation of head of department on form provided. Proper records must be kept by each department so that this form may be submitted promptly at the end of the six months' term, in the event of satisfactory service.

Any employe on the temporary staff found incompetent for transfer to permanent staff must be relieved from the service, & notification sent to this office on form provided.

The fact that any employe is or has been on the permanent staff within the meaning of the above regulations, shall not in any way affect or alter the rights of either the Co. or of such employe in respect of the termination of his services or compensation therefor, & all such rights shall be the same as if there were no such permanent staff as is above provided for.

All new applicants must present, prior to engagement, or if by special arrangement, within 30 days thereafter, testimonials of character or references from previous employers for at least the three years preceding engagement, provided they have been so long employed. Record of such hands on form provided, with copies of testimonials, must immediately on engagement be sent through the proper officers to this office for approval. Heads of departments will take the necessary steps to ascertain that testimonials & credentials presented by new hands are authentic, using form provided for the purpose of communicating with outside parties.

All promotions or change of position of men in the service, with or without change in salary, must be reported to this office for approval on form provided.

In the case of enginemen, trainmen, regular relieving despatchers, relieving agents, & relieving operators, it will only be necessary to report changes when transfer is from one general superintendent's division to another.

No engagement, transfer or promotion will be effective except from day to day until approved by this office.

In submitting forms for approval of employment of new hands, or change of one already in the service, for a temporary period, it must be stated approximately what length of time such engagement or change is intended to cover, & if it be found necessary later to extend the period, another form must be submitted.

Advice of all employes resigning or dismissed from the service must be promptly reported on form provided.

Whenever an employe not included in classes above named (section laborers, freight shed & station porters, &c.), is discharged for such cause as may be considered sufficient to make such person an undesirable future employe on any division, advice must be sent to this office on form provided.

Certificates of service on form provided must only be issued by the following officers:

Managers Eastern & Western lines.
 General superintendents.
 Passenger Traffic Manager.
 Freight Traffic Manager.
 Manager Telegraphs.
 Treasurer.

Supt. S. P. & D. Cars & Hotels.
 Supt. Steamship lines.
 Gen. Purchasing agt.
 General Fuel Agent.
 Supt. Car Service.
 Land Commissioner.
 Supt. Rolling Stock.
 Master Car Builder.
 General Storekeeper.

Such certificates must be numbered consecutively by each department & a copy sent to this office. An employe must not receive certificate on being transferred from one position or department in the Co's service to another. Any person re-employed in the service of the Co. must, on re-employment, return any certificate previously received to the head of the department or officer re-employing him, & same will be retained to be embodied in any future certificate issued. Complete record of all certificates issued must be kept by department issuing same.

Men over 40 years of age seeking employment in the Co's service must not be engaged unless under special authority from head of department. It is the desire of the Co. to fill vacancies that may occur in the service by promotion rather than by the employment of outside experienced men. In promotion, preference will be given to those who show by their work that they have a desire to thoroughly acquire a knowledge & understanding of railway work.

In the clerical staff, preference will be shown those who become proficient in shorthand, typewriting & telegraphy, & the Co. will establish schools at Montreal, Toronto, & Winnipeg, for the purpose of giving employes an opportunity of acquiring a knowledge of the same.

The Central Canada Chamber of Mines, which has its headquarters at Winnipeg, has obtained several concessions & a grant of \$1,000 from the C.P.R.

This century received from its predecessor the sailing ship; it bequeaths to its successor the steamship; it received the beacon signal fire; it bequeaths the telephone & wireless telegraphy.

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LaBelle Steel Co.

Pittsburgh, Pa.

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Agent for Canada,

31 Melinda St., - Toronto

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The following notice is posted on the wall of a railway station in New Hampshire:—

Notice.—Loafing either in or about this room is strictly forbidden, and must be observed.

Myer.—I wonder what causes concussion of the brain?

Gyer.—A collision between two trains of thought, I suppose.

A landscape photographer has been engaged for the Delaware, Lackawanna & Western R.R. to take a six weeks' trip over the road for the purpose of photographing scenes upon it. A special locomotive will be provided, & a platform will be built in front of it, enabling the photographer to take pictures while the train is in motion.

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For Doors, etc., in Stations, Steamships, Ferries, Hotels, Offices, etc., carried in Stock for Prompt Delivery.

Any of these Plates can be shipped on the day an order is received.

SMOKING ROOM

Size 23 x 3½ inches. Oblong, fancy ends, white ground, blue letters, lined & tipped:

Agent's Office.	Waiting Room.
Express Office.	General Waiting Room.
Freight Office.	Ladies' Waiting Room.
General Offices.	Men's Waiting Room.
Private Office.	Dining Room.
Ticket Office.	Lunch Room.
Telegraph Office.	Restaurant.
Baggage Room.	Ladies' Toilet.
Smoking Room.	Men's Toilet.
Smoking Prohibited. No Admittance.	
Trespassers Prosecuted.	

NO ADMITTANCE

Size 10 x 2½ inches. Oblong, oval ends, white ground, blue letters, lined & tipped, hollowed:

Bar Room.	Men.
Luggage Room.	Private.
Office.	No Admittance.
Refreshments.	No Road.
Exit.	Boarding House.
Fire Escape.	Private Board.
Lavatory.	Dressmaking.
Ladies.	Fresh to Day.
Women.	Teas Provided.
Gentlemen.	Please Shut the Gate.

Size 14 x 3 inches. Oblong, oval ends, white ground, blue letters, lined and tipped.

No Admittance.

STICK NO BILLS

Size 18 x 3½ inches. Oblong, square ends, white ground, blue letters, lined & tipped.

Furnished Apartments. Stick no Bills. Please Shut the Door.

PUSH PULL

Oval, size 2 x 3 inches, white ground, blue letters, tipped, hollowed, lettered **Push, Pull**, as above.

Oblong, square ends, size 3 x 1½ inches, white ground, blue letters, tipped, lettered **Push, Pull**, as above.

Perpendicular, square ends, size 12 x 3 inches, white ground, blue letters, lined & tipped, lettered perpendicularly, **Push, Pull**.

Oblong, square ends, size 12 x 3 inches, white ground, blue letters, lined and tipped, lettered horizontally, **Push, Pull**.

Oblong, fancy ends, size 3 x 1½ inches, white ground, blue letters, lined and tipped, lettered **Push, Pull**.

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Railway Station Names, Switch Targets, Semaphore Arms, Whistle & Diamond Crossing Signs, Numbers for Railway Bridges, Sections, Mileage Signal Houses, etc.; Street Car Route Signs; Steamship & Ferry Signs; Express, Telegraph & Telephone Office Signs; Agency, Office, Store, Wagon, Cart & Advertising Signs; Street Names & Numbers; Door Numbers.

These signs last practically for ever, they never fade or tarnish, they are ever bright and attractive, they are absolutely impervious to heat or cold, they are the only signs that will withstand the effects of weather in all climates.

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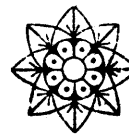
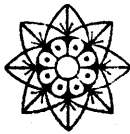
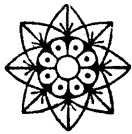
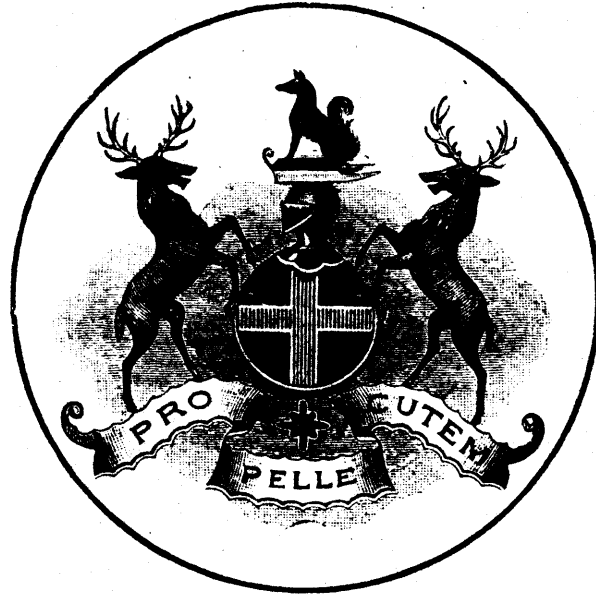
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To the Manufacturers of & Dealers in Steam & Electric Railway, Steamship, Express, Telegraph & Telephone supplies, &c.

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Aerated Waters E. L. Drewry..... Winnipeg.	Hardware Rice Lewis & Son..... Toronto. The Hudson's Bay Company.....	Shipbuilders' Tools & Supplies Rice Lewis & Son..... Toronto.
Air Brakes & Fittings Westinghouse Mfg. Co..... Hamilton, Ont.	Headlights Noah L. Piper & Sons..... Toronto.	Ships Polson Iron Works..... Toronto.
Ales E. L. Drewry..... Winnipeg.	Hose Rice Lewis & Son..... Toronto.	Shovels James Cooper..... Montreal. The Hudson's Bay Company..... Rice Lewis & Son..... Toronto.
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Att Rice Lewis & Son..... Toronto.	Iron Signs Acton Burrows Co..... Toronto.	Signs Acton Burrows Co..... Toronto.
Boats & Bedding Hudson's Bay Company.....	Japans McCaskill, Dougall & Co..... Montreal.	Signs Acton Burrows Co..... Toronto.
Boat Tackle Rice Lewis & Son..... Toronto.	Lager Beer, &c. E. L. Drewry..... Winnipeg.	Snow Ploughs Rhodes, Curry & Co..... Amherst, N.S.
Boilers & Hardware Rice Lewis & Son..... Toronto.	Lamps & Lanterns The Hudson's Bay Company..... Rice Lewis & Son..... Toronto. Noah L. Piper & Sons..... Toronto.	Spikes Rice Lewis & Son..... Toronto.
Boiler Fitting Polson Iron Works..... Montreal.	Launches Polson Iron Works..... Toronto.	Station Name Signs Acton Burrows Co..... Toronto.
Boiler Works Polson Iron Works..... Toronto.	Life Insurance Independent Order of Foresters..... Toronto. Travelers' Insurance Co..... Montreal.	Steamboats Polson Iron Works..... Toronto.
Boilers & Son Rice Lewis & Son..... Toronto.	Linoleum and Floor Coverings The Hudson's Bay Company.....	Steamboat Signs Acton Burrows Co..... Toronto.
Boilers Rice Lewis & Son..... Montreal.	Locomotives Baldwin Locomotive Works..... Philadelphia, Pa. Richmond Locomotive & Machine Works..... Richmond, Va.	Steam Shovels James Cooper..... Montreal.
Boilers Rice Lewis & Son..... Toronto.	Lubricators Rice Lewis & Son..... Toronto.	Steel James Hutton & Co..... Montreal. Rice Lewis & Son..... Toronto.
Boilers Hudson's Bay Company.....	Lumber The Haliburton Lumber Company..... Toronto.	Steel Castings F. E. Came..... Montreal.
Boilers, Curry & Co. Amherst, N.S.	Matches The Hudson's Bay Company.....	Switch Targets Acton Burrows Co..... Toronto.
Boilers, Curry & Co. Amherst, N.S.	Milepost Numbers Acton Burrows Co..... Toronto.	Switches F. E. Came..... Montreal. Canada Foundry Co..... Toronto.
Boilers, Curry & Co. Amherst, N.S.	Mohair The Hudson's Bay Company.....	Telegraph Office Signs Acton Burrows Co..... Toronto.
Boilers & Son Toronto.	Numbers Acton Burrows Co..... Toronto.	Telephone Office Signs Acton Burrows Co..... Toronto.
Boilers, Top Pins & Side Blocks Firstbrook Box Co..... Toronto.	Oakum Rice Lewis & Son..... Toronto. The Hudson's Bay Company.....	Timber The Bradley Company..... Hamilton, Ont. The Haliburton Lumber Company..... Toronto.
Boilers Hudson's Bay Company.....	Oils Galena Oil Co..... Franklin, Pa. The Imperial Oil Company..... The Queen City Oil Company..... Toronto. Signal Oil Company..... Franklin, Pa.	Tires James Hutton & Co..... Montreal.
Boilers Acton Burrows Co..... Toronto.	Office Signs Acton Burrows Co..... Toronto.	Tobacco and Cigars The Hudson's Bay Company.....
Boilers Acton Burrows Co..... Toronto.	Packing The Fairbanks Co..... Montreal.	Toilet Paper The Hudson's Bay Company.....
Dry Goods The Hudson's Bay Company.....	Pipe Covering Mica Boiler Covering Co..... Montreal.	Tools Rice Lewis & Son..... Toronto.
Electric Car Route Signs Acton Burrows Co..... Toronto.	Plushes The Hudson's Bay Company.....	Track Jacks Duff Manufacturing Co..... Allegheny, Pa. A. O. Norton..... Coaticook, Que.
Enameled Iron Signs Acton Burrows Co..... Toronto.	Pneumatic Tools F. E. Came..... Montreal.	Track Tools F. E. Came..... Montreal. James Cooper..... Montreal. Rice Lewis & Son..... Toronto.
Engines, Stationary & Marine Polson Iron Works..... Toronto.	Porter E. L. Drewry..... Winnipeg.	Tramway Equipment J. J. Gartshore..... Toronto.
Engraving Acton Burrows Co..... Toronto. Toronto Engraving Co..... Toronto.	Portland Cement Rice Lewis & Son..... Toronto.	Trucks Rice Lewis & Son..... Toronto.
Express Office Signs Acton Burrows Co..... Toronto.	Printing The Hunter, Rose Co..... Toronto. The Mail Job Printing Company..... Toronto.	Union Couplings E. M. Dart Manufacturing Co., Providence, R.I.
Fencing Page Wire Fence Co..... Walkerville, Ont.	Pumps Rice Lewis & Son..... Toronto.	Varnishes McCaskill, Dougall & Co..... Montreal.
Ferry Signs Acton Burrows Co..... Toronto.	Rails (New) James Cooper..... Montreal. J. J. Gartshore..... Toronto. Rice Lewis & Son..... Toronto.	Vessels Polson Iron Works..... Toronto.
Flags Rice Lewis & Son..... Toronto. The Hudson's Bay Company.....	Rails (for relaying) James Cooper..... Montreal. J. J. Gartshore..... Toronto.	Waste Rice Lewis & Son..... Toronto. Noah L. Piper & Sons..... Toronto. The Queen City Oil Co..... Toronto.
Foghorns Rice Lewis & Son..... Toronto.	Rail Saws F. E. Came..... Montreal.	Water Meters Westinghouse Mfg. Co..... Hamilton, Ont.
Gas & Gasoline Engines Northey Manufacturing Co..... Toronto.	Rope Rice Lewis & Son..... Toronto. The Hudson's Bay Company.....	Wheelbarrows James Cooper..... Montreal. Rice Lewis & Son..... Toronto.
Gates Page Wire Fence Co..... Walkerville, Ont.	Scales The Gurney Scale Company..... Hamilton, Ont.	Window Blinds The Hudson's Bay Company.....
General Supplies The Hudson's Bay Company.....	Semaphore Arms Acton Burrows Co..... Toronto.	Wines and Liquors The Hudson's Bay Company.....
Grain Elevators John S. Metcalfe Co..... Chicago, Ill.	Shafting Rice Lewis & Son..... Toronto.	Wire & Wire Rope Rice Lewis & Son..... Toronto.
Groceries The Hudson's Bay Company.....		Yachts Polson Iron Works..... Toronto.
Half Tones Acton Burrows Co..... Toronto.		

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