

ONTARIO
NORTHLAND
RAILWAY
DIARY

1914-1918

C H RIFF

Locomotive Mileage.

The following statement shows the mileage made by the locomotives belonging to this railway:—

Engine No.	Miles Run, 1913.	Total Mileage of Engines.
101	24,220	275,278
102	24,045	256,824
103	20,528	234,017
104	25,621	253,000
105	20,832	194,620
106	35,679	218,155
107	17,211	206,889
108	35,577	268,423
109	14,244	240,945
110	26,322	220,325
111	40,579	290,924
112	25,173	277,322
113	30,883	285,818
114	46,138	301,716
115	15,972	161,297
116	20,957	156,907
117	24,050	163,308
118	19,160	171,907
119	20,803	178,966
120	27,793	174,128
121	25,776	152,400
122	29,083	165,420
123	38,387	163,436
124	36,510	148,003
125	27,094	167,597
126	18,885	142,993
127	30,572	143,517
128	24,095	136,798
129	24,426	118,575
130	26,464	94,007
131	15,254	115,546
132	17,884	115,663
133	35,896	66,260
134	19,376	81,766
135	56,840	109,693
136	24,552	79,403
137	37,162	48,533
138	40,726	50,442
139	13,346	15,442
140	28,252	34,796
150	26,117	192,911
151	31,788	259,510
152	38,074	115,536
153	18,842	102,708
Total	1,201,688	7,351,724

Repairs to passenger equipment.

Extensive repairs have been made to passenger equipment at North Bay Junction shop, as follows:—

Coach No. 12, turned out of shop during November, 1912, after having been converted into a combination baggage and passenger car.

Coach No. 112, was given a general repair, interior and exterior repainted and varnished, and turned out of shop during November, 1912.

Coach No. 40, was given a general repair to woodwork, trucks overhauled and scraped and turned out in December, 1912. Interior and exterior of car also repainted and varnished.

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Engines.

275,278
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218,155
206,889
268,423
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351,724

North Bay Junction

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M. & E. No. 23, was repainted and varnished inside and outside, trucks scraped and overhauled, and car turned out in December, 1912.

Bagg. No. 1, had necessary repairs to woodwork, trucks overhauled, was repainted and varnished, and turned out in January.

Coach No. 102, necessary repairs to woodwork, trucks given a general overhauling, exterior and interior of car repainted and varnished, turned out in February.

Coach No. 28, necessary repairs to woodwork, interior and exterior of coach repainted and varnished, trucks overhauled. Turned out in March.

Cafe Cars Tetapaga and Wasaksima, given minor repairs to interior of cars during the month of March.

Coach No. 10, rebuilt into combination first class and baggage car in April.

Coach No. 106.—Had general repairs, repainted and varnished both inside and outside, trucks given general overhauling and car turned out of shop in April.

Coach No. 26, this car was given a general repair, exterior and interior repainted and varnished, slat blinds replaced with roller blinds. Car turned out of shop in July.

M. & E. Car 5, general repairs and painting on both exterior and interior of car. Trucks given a general overhauling. Turned out in July.

Bagg. No. 9, general repair on body and trucks of car, exterior and interior of car repainted and varnished and car turned out of shop in August.

Coach No. 107, trucks given general overhauling, one new outside sill also new sheathing on one side of car (due to derailment on G.T.R.). Exterior and interior repainted and varnished and new blinds applied, and turned out in August.

Coach No. 104, given general repair to woodwork inside and outside. Trucks rebuilt, exterior and interior of car repainted and varnished. Turned out in August.

Exhibition Car, windows and doors repaired, two windows closed up. Trucks repaired, revarnished. Turned out in August.

M. & E. car 23, given a general repair, repainted and varnished, and turned out in October.

Official Cars

Official car "Sir James" was taken into shop during the latter part of October, 1912, was given a general overhaul, repainted and varnished, and the Stone Electric Lighting System installed, necessitating alterations in the location of gas tanks, provision boxes, etc., to make room for the battery boxes. The trucks were also gone over thoroughly and a new set of springs applied. Car was turned out of shop in December, 1912.

The car "Temagami" was given a general repair to interior and exterior of car, was repainted and varnished, and the name changed to "Abitibi." She was also equipped with new carpets. Turned out of shop during July.

Coach Cleaning

Statement showing the number of coaches cleaned at the different stations during the year.

Station	Number of Coaches Cleaned.
North Bay Junction	2,281
Anglehart	5,310
Cochrane	3,047
Timmins	1,849
Total	12,487

Repairs to Conductors' Vans.

During the past year vans Nos. 53, 60, 68, 58, 62, 54, 65, 59, 57, and 67 have been overhauled and necessary repairs made and vans repainted.

Repairs to Freight and Work Equipment.

The following cars have been rebuilt at the North Bay Junction shop during the year:—

Numbers 60431, 60639, 60179, 60309, 60111, 60359, 60199, 60393, 60369, 60019, 60769, 60147, 60207, 60633, 60001, 60163.

New sills have been applied to 95 cars.

Ninety-three flat cars have been redecked.

New roofs have been applied to two cars.

Seven thousand four hundred and sixteen cars have been repaired for foreign roads and bills collectible covering the cost of repairs have been rendered against the car owners, in accordance with the standard code of rules governing the conditions of repairs to freight cars, for the interchange of traffic, adopted by the Master Car Builders' Association. In addition to this, bill has been rendered monthly against the Grand Trunk Railway System, covering the cost of repairs to fifteen thousand two hundred and thirty-six cars, under the terms of the Grand Trunk Running Rights Agreement, an actual cost of labor and material plus 10 per cent.

Snow plough No. 3 was released from the shop on November 8th, 1912, after having a new front applied, trucks repaired, and general painting. Flangers Nos. 1 and 2 were also in shop during November, 1912, and were painted exterior and interior. Snow plow No. 2 was repainted in October, 1913. Snow plow No. 4 was taken into shop and had a new front put in, was repainted, and turned out in October, 1913. Necessary repairs have been made to the rest of the work equipment as required. The auxiliary cranes have been repainted and the balance of the auxiliary equipment has been maintained in good condition and ready for immediate service at all times.

Steel Tyres Turned and Wheels Applied to Rolling Stock.

During the year 54 pairs of driving tyres, 78 pairs of coach tyres, 47 pairs of tender wheels, 30 pairs of engine truck wheels, and 12 pairs of wheels for the Nipissing Central Electric cars have been turned on the wheel lathe at North Bay Junction.

The following tyres were bored out before being applied to wheels: 60 coach tyres, 28 tender tyres, 8 driving wheel tyres, 20 tyres applied to Nipissing Central cars.

At Englehart the wheel press, installed during 1912, has been doing good work, 1,106 wheels having been pressed off axles, new wheels bored and remounted on axles.

New wheels have been applied to T. & N. O. rolling stock as follows:—

To Locomotives.

2 pairs 30 in. C.I. wheels mounted on $3\frac{3}{4}$ x 7 in. axles.

6 pairs 33 in. C.I. wheels mounted on $3\frac{3}{4}$ x 7 in. axles.

6 pairs 33 in. C.I. wheels mounted on $4\frac{1}{4}$ x 8 in. axles.

54 pairs 33 in. C.I. wheels mounted on 5 x 9 in. axles.

6 — 57 in. driving tyres; 38 — 33 in. tender truck tyres; 6 — 28 in. engine truck tyres.

Passenger Equipment.

2 pair steel tyre

60 — 36 in. steel

5 pairs wheels c

Freight Equipment.

6 pairs 33 in. C

68 pairs 33 in. C

36 pairs 33 in. C

4 pairs 33 in. C

Work Equipment.

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Foreign Cars.

36 pairs 33 in. C

39 pairs 33 in. C

47 pairs 33 in. C

107 pairs 33 in. C

Rolling Stock Destroyed.

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MOTIVE POWER AND CAR DEPARTMENT

Annual Report for Year Ending October 31st, 1914, of Mr. Thos. Ross,
Master-Mechanic.

New Rolling Stock.

In June the Pullman Company started to make delivery of the steel coaches for which contract was awarded them August 29th, 1913. The first lot was received at North Bay Junction, June 23rd, via G. T. R., and comprised a complete train consisting of one mail and express car No. 201, one baggage and express car No. 211, one second class coach No. 221, one combination second and first class smoking coach No. 231, and one first class coach No. 241. June 24th baggage and express car No. 212 and second class coach No. 222 were received via G. T. R., and on July 1st the remainder of the order consisting of mail and express cars No. 202 and 203, combination second and first class coaches No. 223 and 233, and first class coaches No. 242 and 243 were delivered via C. P. R.

All cars were delivered complete in every respect for service with the exception of the electric lighting dynamo, batteries, switchboard and wiring thereto. The apparatus was supplied by the J. Stone Co., Ltd., and applied by the T. & N. Ry. The first lot of these cars, consisting of baggage and express car No. 211, combination car No. 233, and first class car No. 243, were completed and put in service on train No. 46, North Bay to Toronto, on August 3rd, 1914.

The following is a general description of each of the different classes, from which it will be seen that they are of the most modern steel construction and first class equipment throughout.

Mail and Express Cars.—Length over end sills, 60 ft.; centre to centre of trucks, 42 ft.; length of mail compartment, 30 ft.; width over side sheets, 10 ft.; width over all at eaves, 10 ft. 2 7/8 in.; width deck opening, 5 ft. 10 in.; width deck over eaves, 6 ft. 8 5/8 in.; height from rail to top of roof sheets, 14 ft. 1 1/4 in. The underframing consists of Commonwealth Steel Co's combined cast steel bolsters and platform with fish belly type, centre still composed of two 5-16 in. plates 26 in. deep at centre, spaced 18 in. apart, with two 5 in. by 3 1/2 in. by 1/2 in. angles on the outside, and 3 3/8 in. by 30 in. cover plate at top, and four 3 in. by 3 in. by 3/8 in. angles at bottom. Cross ties, two, Commonwealth Steel Co's cast steel, spaced 6 ft. 3 in. each side of centre of car, with cast steel centre sill spacers also one additional cast steel centre sill spacer at centre of car. Sides consist of a 3-16 in. plate, 34 in. high, with 44 in. by 1 3/8 in. by 7-16 in. dropper bar on outside at top, and at the bottom on the inside a 4 in. by 4 in. by 5-16 in. angle rivetted to a 5 in., 11.6 lb. Z-bar, the latter being rivetted to the cast steel bolster and cross ties. The 3-16 in. plates form the side sheathing of car below windowsills, and the openings through same for the baggage and mail side doors are suitably reinforced. The end framing consists of two 12 in.—31.5 lb. I beams, 23 1/2 in. each side of centre line of car, with two 4 in.—8.2 lb. Z bar intermediate posts and the corner posts are each composed of a 4 in.—8.2 lb. Z bar and a 6 in. by 4 in. by 3/8 in. angle. The side sheathing above the belt and the end sheathing is 1/8 in. plate. The roof is of steel .078 in. thick on upper deck and .063 in. on lower deck with pullman standard roof joints. The inside side and end finish of the mail end is .063 in. flat steel plate with 3-16 in. fireproof agasote ceilings to upper and lower decks, while the express end is finished in .038 in. corrugated steel through

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Mr. Thos. Ross,

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The first lot was and comprised one 01, one baggage and combination second and No. 241. June 24th, Nos. 222 were received consisting of mail and class coaches No. 232 red via. C. P. R.

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out with 3-16 in. agasote ceiling to upper deck and .038 in. steel to lower deck. The floor is of 1 1/4 in. matched maple with two air spaces and two courses of insulation below. The insulation used is 3/4 in. fireproof Flaxlinum on all outside sheets and 3/4 in. Salamander to all inside sheets, these latter being also insulated from the framing of car wherever possible with 1/8 in. agasote. Other items are as follows: Six wheel Commonwealth Cast Steel trucks with 36 in. Schoen solid steel wheels, McCord journal boxes with pinless covers, Vanadium steel springs, Simplex brake beams, journal bearings, Canadian Bronze Co's make; Westinghouse air brake Schedule LN-1812, Westinghouse friction draft gear, Tower couplers, National centering device, Forsyth friction buffing gear, Ajax diaphragms, Stone Co's electric lighting system (24 volts), 10 Automatic Ventilator Co's intake and exhaust ventilators, Gold Car Heating Co's straight steam heating system with electric thermostat control (also Chicago Car Heating Co's No. 800 stove as auxiliary in mail end), equipment of mail end steel throughout, arranged to conform to the U. S. R. M. S. specifications and plans for 30 ft. mail compartment cars; hand brakes, steps, handholds, etc., to Railway Commission's standards.

Baggage and Express Cars.—Length over end sills, 60 ft.: centre to centre of trucks, 42 ft.; width over side sheets, 10 ft.; width over all at eaves, 10 ft. 2 7/8 in.; width deck opening, 5 ft. 10 in.; width over eaves of deck, 6 ft. 8 5/8 in.; height from rail to top of roof sheets, 14 ft. 1 1/4 in. The general description of the mail and express cars, with the omission of that re the mail end, is also applicable to these cars, the same design and equipment being followed throughout.

Passenger Coaches.—The three classes of cars under the above heading, i.e., second class, combination first and second class smoking, and first class cars are practically similar, the main differences being in the seat upholstering and the addition of a partition in the smoking car. Length over end sills, 71 ft.; centre to centre of trucks, 55 ft.; width over side sheets, 10 ft.; width over all at eaves, 10 ft. 2 $\frac{7}{8}$ in.; width deck opening, 5 ft. 10 in.; width deck over eaves, 6 ft. 8 $\frac{5}{8}$ in.; height from rail to top of roof sheets, 14 ft. 1 $\frac{1}{4}$ in.; seating capacity 80. The underframing consists of Commonwealth Steel Co's combined cast steel bolsters and platforms with fish belly type centre sill composed of two 5-16 in. plates 26 in. deep at centre, spaced 18 in. apart, with two 5 in. by 3 $\frac{1}{2}$ in. by $\frac{1}{2}$ in. angles on the outside and $\frac{3}{8}$ in. by 30 in. cover plate at top, and at the bottom four 3 in. by 3 in. by $\frac{3}{8}$ in. angles. Cross ties, two, Commonwealth Steel Co's cast steel, spaced 12 ft. 9 in. each side of centre of car with cast steel centre sill spacers, also one additional cast steel centre sill spacer at centre of car. Sides consist of a 3-16 in. plate 34 in. high, with 4 in. by 1 $\frac{3}{8}$ in. by 7-16 in. dropper bar on outside at top, and at the bottom on the inside a 4 in. by 4 in. by 5-16 in. angle rivetted to a 5 in.-11.6 lb. Z bar, the latter being rivetted to the cast steel bolsters and cross ties. These 3-16 in. plates form the side sheathing of the car below the windows, the sides above being $\frac{1}{8}$ in. plate. The side posts are of pressed steel $\frac{1}{8}$ in. thick, 5 in. deep. The "Dean" Anti-telescoping device has been included in the end framing. This consists of two 6 in.-23.9 lb. I beams, bent in one continuous piece to form both the car end door posts and the vestibule centre posts; there are four 4 in.-8.2 lb. intermediate end posts and the corner posts are each composed of a 4 in.-8.2 lb. Z bar, and a 4 in. by 4 in. by $\frac{1}{4}$ in. angle. The end sheathing outside is 3-32 in. plate and inside $\frac{1}{8}$ in. plate. The roof outside is of steel .078 in. thick on upper deck and .063 in. on lower deck. The flooring is Flexolith throughout (except the saloons and lavatories—white tile) laid on Keystone corrugated steel; below this is provided two separate courses of $\frac{3}{4}$ in. insulation and air spaces.

Fireproof agasote is used for the ceilings and also on the side walls below the window sills to the top of heater pipe angle or about 10 in. above top of floor, the window sills, window casings and sash being of Mexican mahogany. The remainder of the interior finish is of steel grained mahogany in the body of the car and enamelled white in saloons and lavatories.

Other items are as follows: Six wheel Commonwealth cast steel trucks with 36 in. Schoen solid steel wheels, McCord journal boxes with pinless lids, vanadium steel springs, simplex brake beams, Canadian Bronze Co's journal bearings; Westinghouse air brake Schedule LN-1812, Westinghouse friction draft gear, Tower couplers, National centering device; Forsyth friction buffing gear, Ajax diaphragms, National steel trap doors; Gold Car Heating Co.'s straight steam heating system with electric thermostat control, Hale & Kilburn No. 194 pressed steel seat (upholstered in imitation leather in second class and smoking cars and in plush in first class cars), McCord weatherstrip and window fixtures on all side window sash, pantasote window curtains with Curtain Supply Co's ring curtain fixture, Stone Co's electric lighting system (24 volt) with twelve two light centre fixture in body of car and single light fixtures in saloons, lavatories and vestibules, McCarthy continuous basket racks, air pressure water system, The Automatic Ventilator Co's intake and exhaust ventilators are used, there being ten ventilators per car; Duner cast iron flushing closets, white metal wash stands and water coolers, the latter having separate ice compartments. These cars are also equipped with two electric fans each.

They have proved very satisfactory, being very smooth riding and there is very little of the metallic sound which is sometimes very noticeable on steel cars. The ventilation appears to be very good and judging from their action during the short spell of cold weather which occurred recently, it is thought that there will be no difficulty in maintaining them at a comfortable temperature during the severe winter weather.

Equipment Pacific Type Passenger Locomotives with Superheater:

From the economical results obtained by the use of the superheater on the Consolidation freight engines, it has been decided to apply them to our larger passenger engines and offset to some extent the extra cost of fuel for hauling and heating the new steel passenger equipment. At the same time we somewhat increased the tractive power of these engines by putting on new cylinders 22 in. by 28 in. (as against 21 in. by 28 in.) and decreased the boiler pressure from 200 lbs. to 190 lbs. These new cylinders are equipped with 12 in. piston valves. The superheater adopted is the Schmidt type A, top header with outside steam pipes.

The work of installing the superheaters, etc., was allotted to the Canadian Locomotive Co., Kingston, Ont., and three engines Nos. 133, 135 and 136 have been completed. Tests made of these engines before and after superheating show that although the weight of train has increased nearly 30 per cent. there has been a reduction in fuel consumed of approximately 15 per cent.

Electric Cars for Nipissing Central Railways

In July two new cars were received from the Preston Car and Coach Co. These are double end, interurban type, with single arch roof, 51 ft. in length over all, arranged with smoking and baggage compartments, and have seating capacity for 52 persons. The underframes are of steel and the bodies of wood finished in cherry inside. The Smith hot air system is used for heating and the roof is

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Boston Creek:

A public spur siding 349 ft. long was constructed to take care of the business developments around this locality due to the numerous gold discoveries.

Porquis Junction:

A spur siding 450 ft. long was laid in connection with the new coaling plant now being erected.

M.P. No. 233:

A public spur siding 678 ft. long was built at M.P. 233 to take care of the pulpwood being cut in this locality. This siding is about half way between Nellie Lake and Holland.

M.P. No. 245.5:

This public spur was extended 362 ft. to provide additional shipping facilities for the pulpwood being cut in that vicinity.

Cochrane:

A connection was installed between the T. & N. O. Railway and the Transcontinental Railway main lines at the diamond crossing west of the Union Station for the interchange of through passenger traffic from one line to the other. This allows the T. C. Railway passenger trains to use the south side of the station. A similar connection was installed east of the station for the same purpose.

Iroquois Falls:

It was found that the facilities provided at this point for the handling of cars to and from the Abitibi Power and Paper Company's mill were inadequate, so to provide the additional accommodation required, three new transfer sidings were constructed, one of 2,872 ft., one of 1,390 ft., and the third 1,152 ft.

Additional Yard Facilities under Construction at the Close of Year.

North Bay Junction:

No. 10 yard track is being extended to serve new boiler plant at carpenter shop:

Ramore:

An eight car siding is being constructed at this point.

Industrial Tracks Constructed.

Temagami:

Milne's spur at M.P. 73.6 was extended 251 ft.

Iroquois Falls:

The coal spur of the Abitibi Power and Paper Company was extended 175 ft.

M.P. 11.0, Porcupine

A private spur three cars for the s

M.P. 23, Porcupine

A private siding
This siding is 277

M.P. 39.2, Porcupine

A spur 2,079
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Timmins:

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North Bay Junction

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M.P. 11.0, Porcupine Sub-division:

A private spur siding at M.P. 11.0 for M. Holgevac. Siding 251 ft. to hold three cars for the shipment of pulpwood, etc.

M.P. 23, Porcupine Sub-division:

A private siding was constructed for Crawford & Levison at M.P. 23.0. This siding is 277 ft. long to hold four cars for the shipment of forest products.

M.P. 39.2, Porcupine Sub-division:

A spur 2,079 ft. long was built from the main line of the Porcupine Sub-division to the Hollinger Mine mill. A short spur 420 ft. long was built near the end of the one mentioned above.

Timmins:

A spur siding 528 ft. long was constructed to serve Marshall-Ecclestone's warehouse.

New Buildings.*North Bay Junction:*

The coach and carpenter shops were enlarged and rearranged, including a new paint shop and a new frame boiler house. In this connection a four inch water main was extended to the boiler house with branches in the various buildings for fire protection. A new sand house 18 x 22 ft. was erected near the round-house.

Haileybury:

The freight shed was raised one foot and an eight foot platform was constructed. The tracks were rearranged to suit this improvement.

Elk Lake:

A coal shed 11 x 21 ft. was built for hard coal storage for passenger cars.

Nushka:

A new standard section house was built at this point to replace section house at Monteith which was transferred to the Department of Agriculture.

Hoyle:

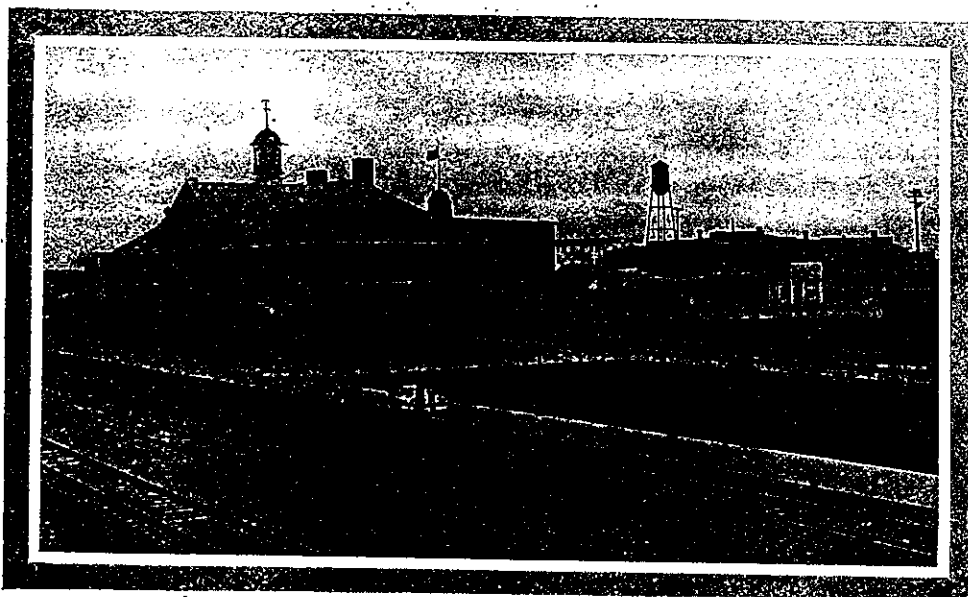
A standard shelter station was built just west of the Porcupine River.

Porquis Junction:

There is under construction at this point a 100-ton Roberts & Schaeffer mechanical coaling plant, also a 41,600 gal. steel water tank with two Sheffield-Johnston stand pipes and frame pump house pipe lines, etc., in connection therewith.



First "National" Train Leaving Cochrane Station for Winnipeg, July 14th, 1915.



Union Station, Cochrane, July, 1915.

1916 NORTH

GENERAL

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The amount of
1915, and the gross
1914:

Tonnage 1915
Tonnage 1914

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- Engine No. 130, light repair in April and again in August.
- Engine No. 133, heavy repair during September.
- Engine No. 134, heavy repair in December, 1912.
- Engine No. 137, heavy repair in May.
- Engine No. 140, tires turned in March.
- Engine No. 150, heavy repair during May.
- Engine No. 151, general repair and new boiler tubes applied during August 1913.
- Engine No. 152, heavy repair during April.
- Engine No. 153, general repair and new boiler tubes applied during April.

NOTE: The term "General Repair," as used above, refers to cases where an engine has received a thorough overhauling and rebuilding. "Heavy Repair" refers to cases where an engine has been given such repairs as driving tires turned, driving boxes renewed, valves, piston rings, and side rod bushings renewed. "Light Repair" refers to cases where an engine has received minor repairs, such as renewals of side rod bushings, piston rings and valve rings.

Each engine has had the boiler washed out once every two weeks when in regular service. Staybolts in fire boxes have been regularly tested and renewals made when necessary. Nettings, ash pans, and dampers have been regularly examined at the end of each trip during the summer season, as a precaution against fire. During damp weather and at such times as the danger from this source is reduced to a minimum, the nettings, ash pans, and dampers have been examined twice a week.

Engine Dispatch.

Statement showing the number of engines dispatched from the different terminal and divisional points during the year:—

Station.	Number of Engines Dispatched.
North Bay Junction	6,203
Cobalt	320
Englehart	3,786
Elk Lake	248
Timmins	927
Cochrane	1,044
Total	12,528

The Motive Power has been generally assigned during the year as follows:—

- Engine No. 101, work service.
- Engine No. 102, work service.
- Engine No. 103, work service.
- Engine No. 104, work service.
- Engine No. 105, work service.
- Engine No. 106, freight service.

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Number of Engines
Dispatched.

6,203
320
3,786
248
927
1,044

12,528

ar as follows:—

- Engine No. 107, passenger service.
- Engine No. 108, passenger service.
- Engine No. 109, passenger and work service.
- Engine No. 110, passenger service.
- Engine No. 111, passenger service.
- Engine No. 112, passenger service.
- Engine No. 113, passenger service.
- Engine No. 114, passenger service.
- Engine No. 115, freight service.
- Engine No. 116, freight service.
- Engine No. 117, freight service.
- Engine No. 118, freight service.
- Engine No. 119, freight service.
- Engine No. 120, switching service.
- Engine No. 121, freight service.
- Engine No. 122, freight service.
- Engine No. 123, freight service.
- Engine No. 124, freight service.
- Engine No. 125, work service.
- Engine No. 126, freight service.
- Engine No. 127, passenger service.
- Engine No. 128, freight service.
- Engine No. 129, freight service.
- Engine No. 130, work service.
- Engine No. 131, freight and passenger service.
- Engine No. 132, freight service.
- Engine No. 133, passenger service.
- Engine No. 134, passenger service.
- Engine No. 135, passenger service.
- Engine No. 136, passenger service.
- Engine No. 137, freight service.
- Engine No. 138, freight service.
- Engine No. 139, freight service.
- Engine No. 140, freight service.
- Engine No. 150, switching service.
- Engine No. 151, switching service.
- Engine No. 152, switching service.
- Engine No. 153, switching service.

MOTIVE POWER AND CAR DEPARTMENT

Annual Report for the Year Ending October 31st, 1913, of Mr. T. Ross,
Master Mechanic.

New Rolling Stock.

Electric Cars for Nipissing Central Railway.

In January, two street cars were received from the Preston Car and Co. Company. These are of the double end, interurban type, 47 feet 6 inches long over all, arranged with smoking compartment, and have seating capacity of fifty people.

In June, 1913, a combination car was received from the Russell Car and Snow Plow Company, Ridgeway, Pa., for use as switching locomotive, baggage and express car, and snow plow. It is of the double end type, equipped with detachable snow plows at each end, four 75 h.p. motors, and weighs complete without plows, 52,000 lbs.

New Passenger Cars.

A further addition to the passenger equipment of the Temiskaming and Northern Ontario Railway being found necessary, a contract was let in June to the Pullman Company for thirteen cars, comprising three mail and express cars, two baggage cars, two second class cars, three combination first and second class sleeping cars, and three first class cars. These cars are to be of modern steel construction, equipped with six wheel steel trucks and electric lighted throughout.

Electrical Work.

The new carpenter shop of the Bridge and Building Department and the Department storehouse at North Bay Junction have been equipped with the necessary wiring and electrical equipment for lighting service. New electric machinery has been installed at the stock yards and also at the ice house. Necessary repairs have been made to the electrical plant and equipment at North Bay Junction to keep them in good running order. Alterations on transmission line to general office building have been made in connection with new C.P.R. entrance.

Electric lights have been installed in section house at Cobalt, and general electrical repairs in station, freight shed and agent's house have been attended to.

At Kerr Lake the station has been equipped with electric lights.

Electric lights have been installed in station and freight shed at North Cobalt.

At Halleybury and New Liskeard the electrical equipment has been repaired over from time to time, and necessary repairs and renewals made.

The station at Elk Lake has been wired and electric lights installed.

The ice house at Englehart has been furnished with electric lights. The electrical equipment in station, freight shed, greenhouse, tenement and section houses, round house and bunk room have had necessary maintenance repairs and renewals. Generator and entire plant and transmission line have been kept in good repair.

DEPARTMENT

31st, 1913, of Mr. T. Ross,

from the Preston Car and Coach
ban type, 47 feet 6 inches long
and have seating capacity for
received from the Russell Car and
is switching locomotive, baggage
double end type, equipped with
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ment of the Temiskaming and
a contract was let in June to the
three mail and express cars, two
ation first and second class smoke
to be of modern steel construction
electric lighted throughout.

Building Department and Road
have been equipped with the neces-
sary service. New electric me-
the ice house. Necessary repairs
equipment at North Bay Junction
on transmission line to gener-
the new C.P.R. entrance.

ion house at Cobalt, and gener-
ent's house have been attended to
with electric lights.

and freight shed at North Cobalt
electrical equipment has been gone
and renewals made.

and electric lights installed.
ished with electric lights.

greenhouse, tenement and section
necessary maintenance repairs and
transmission line have been kept in

1914 NORTHERN ONTARIO RAILWAY COMMISSION.

The station and freight shed at Charlton have been wired and installed
electric lights.

At South Porcupine, the freight shed has been installed with electric lights,
and general electrical repairs have been made in station.

The Agent's house at Schumacher has also been installed with electric lights.

At Timmins, general repairs have been made to electrical equipment in
station, freight shed, and engine house, but no new equipment has been installed
at this station.

At Cochrane, the necessary maintenance repairs and renewals have been taken
care of.

In addition to the above work, the electric headlights on all engines, snow
plows, and wrecking cranes, have been maintained in good condition throughout
the year.

The following tabulated statement shows a comparison of the number of
kilowatt hours used each month at North Bay, Englehart and Cochrane, during
the years 1911, 1912 and 1913.

Month	NORTH BAY			ENGLEHART			COCHRANE		
	1911	1912	1913	1911	1912	1913	1911	1912	1913
January	5,261	8,574	9,979	6,160	6,590	6,480	1,251	3,034	1,437
February	4,168	6,225	7,063	5,316	5,785	6,099	913	3,714	1,638
March	3,018	5,684	6,090	6,539	4,834	6,132	936	4,521	1,137
April	2,227	3,427	4,993	3,669	5,100	3,949	609	619	917
May	1,750	2,934	3,182	5,743	4,029	3,973	663	471	1,229
June	2,250	3,119	3,181	3,662	2,476	2,949	287	353	1,555
July	2,268	2,343	3,181	3,779	2,055	3,388	603	435	1,453
August	2,042	3,000	3,181	4,243	2,848	3,576	754	530	1,716
September	3,091	4,133	4,897	4,890	4,570	3,881	1,044	691	867
October	4,859	6,260	6,378	6,277	6,963	5,134	1,663	871	1,063
November	7,134	7,363	.....	7,551	7,363	.....	1,757	1,071	.....
December	9,280	7,652	.....	6,304	6,627	.....	2,223	1,683	.....
Total	47,348	60,714	52,125	64,133	59,240	45,561	12,703	17,993	13,012

New Equipment Applied Locomotives and Cars.

During the year alterations have been made to cupboards in several of our
baggage cars, and gunracks have been applied to express cars for the use of express
messengers. The Safety Car Heating Company's standard heating system has been
installed in combination car No. 10. Coach No. 30 has been equipped with the
Parker Straight Steam Heating System.

Air Brake Equipment.

During the year the air brake equipment of 54 coaches, 257 60,000 lb. cars,
52 80,000 lb. cars, 57 100,000 lb. cars, and 25 miscellaneous equipment have been
cleaned, repaired, and tested as per M.C.B. rules.

Schedule L.N. Brake Equipment has been installed on the following passenger
cars—First class coaches Nos. 10, 101 and 109; second class coach No. 2; work-
ing coaches Nos. 26 and 28, mail and express cars Nos. 1 and 23. New founda-
tion break gear and high speed brake beams have been applied to these cars to

stand the extra strain of the high speed brake. We expect in the early part of 1914 to have all passenger trains equipped and operating the L.N. high speed brake, which is one of the most efficient brakes for passenger service.

Tenders of engines 108, 113, and 128 have been equipped with American Automatic Slack Adjusters. This will give uniform piston travel, which is one of the most essential requirements of good braking.

To facilitate switching in way-freight and work train service, engine No. 122 has been equipped with Schedule S.W.A. brake in addition to the automatic brake.

The schedule E.T. No. 6 brake has been installed on engine No. 107. All main line passenger engines are now equipped with this brake, which is the most efficient engine brake for steam road service.

On March 1st the air pressures used in brake service were raised to the following standards:—

Passenger Service.

Brake Pipe	90 lbs.
Main Reservoir	110 lbs.
Main Reservoir Maximum	125 lbs.

Freight Service.

Brake Pipe	70 lbs.
Main Reservoir	90 lbs.
Main Reservoir Maximum	125 lbs.

The above in connection with the E.T. and L.N. brakes now installed will give one of the best engine and train brakes now available for passenger service. The increasing of main reservoir pressure in freight service to facilitate the release of brakes on long freight trains was brought about by the introduction of the Consolidation Locomotives.

Engines Nos. 109 and 110 have been equipped with H-24 driver brake triples and H-1 tender triples, S-F-4 governors for duplex main reservoir control. These engines can now be used in high speed passenger service.

Engines Nos. 150 and 151 have been equipped with air signal and S.*F. governor, to facilitate the transferring of passenger trains from North Bay Junction to the C. P. R. station.

The air brake equipment of the Nipissing Central Railway has been cleaned, repaired and tested in accordance with Maintenance Regulations issued in December, 1912. The repairing and testing of the equipment is carried on at our North Bay Junction shops, where the facilities for doing this work are of the best. The six motor cars and combination baggage car in service on the Nipissing Central Railway are equipped with the Westinghouse A.M.M. brake, which is especially adapted for both city and high speed interurban train service.

The International Correspondence School Air Brake Instruction Car No. 103 arrived on the T. & N. O. Rly. July 23rd. and remained on the line for nine days. During this time the operation of the air brake was demonstrated to the employees engaged in the movement of trains.

A feed valve testing attachment has been added to the air brake testing rack. At North Bay Junction, and two nine and one-half inch compressors have been installed in the shop for compressing shop air to 125 lbs. This will enable us to test and adjust all feed valves, reducing valves and pump governors before being placed in service on the road.

The car "Sir James" has been equipped with supplementary reservoirs. This car can now be operated in trains equipped with the L.N. or P.C. High Speed Brake.

Summary of Extensive Repairs on Locomotives.

During the year the Motive Power Equipment has been properly maintained and repairs and renewals necessary from time to time have been executed thereon.

Extensive repairs performed on locomotives at North Bay Junction shop as follows—

Engine No. 101, heavy repair during May, 1913.

Engine No. 102, heavy repair during February; was again in shop for heavy repair during August, when she had 75 new tubes applied.

Engine No. 103, heavy repair during June.

Engine No. 104, heavy repair during April, and again in shop for general repair during September.

Engine No. 105, had heavy repair and new boiler tubes applied in April, and was again turned out of shop in October after having received a general repair.

Engine No. 106, had heavy repair and 75 new boiler tubes applied during July.

Engine No. 107, heavy repair during May.

Engine No. 108, general repair during October.

Engine No. 109, heavy repair and new boiler tubes during October.

Engine No. 110, given light repair in April.

Engine No. 111, given heavy repair in August.

Engine No. 112, general repair in September.

Engine No. 113, light repair in January and heavy repair in July.

Engine No. 114, general repair in July.

Engine No. 115, general repair and new boiler tubes during December, 1912.

Engine No. 116, General repair and new boiler tubes during October, 1913.

Engine No. 117, General repair and new boiler tubes, also patch put on side sheet in August.

Engine No. 119, General repair and new boiler tubes in July.

Engine No. 121, general repair and 30 new boiler tubes applied during January and tires turned during March.

Engine No. 122, in shop for light repair during March.

Engine No. 125, in shop for light repair during May.

Engine No. 126, general repair and new boiler tubes during May.

Engine No. 127, general repair and new boiler tubes in January.

Engine No. 128, general repair and new boiler tubes in March.

July 1st, A. T. Woodward, laborer, Cochrane, while handling ice, fell into crevice and sprained his leg.

July 4th, W. Heitman, Machinist, North Bay, was repairing stand pipe, when he fell sustaining slight injuries.

July 8th, J. Lipski, sectionman, Iroquois Falls, fell in front of hand-car on which he was riding and was slightly injured.

August 2nd, H. Wicks, carpenter, North Bay, had one finger and thumb cut by a wood-working machine.

August 9th, C. Myperi, sectionman, Latchford, had left leg broken and head injured by hand-car which was struck by passing train and thrown over on top of him.

September 1st, V. Leduc, laborer on steam ditching machine, slightly injured his back in jumping from one flat car to another.

September 2nd, Dominico Gianfrancesco, laborer, North Bay, had his left arm lacerated, while loading a large piece of rock on a dump cart.

MILEAGE IN OPERATION

October 31st, 1913.

MAIN LINE.

	Miles.
North Bay to Cochrane	252.8
	252.8

BRANCH LINES.

Charlton Branch	7.8
Kerr Lake Branch	3.9
Porcupine Sub-division	40.44
Elk Lake Branch	28.5
	80.64

YARDS AND SIDINGS.

Yards and Sidings, Main and Branch Lines	98.69
Liskeard Spur	0.64
	99.33
Total Mileage	432.77

Report on Steel Freight and Passenger Equipment.

CHIEF ENGINEER AND SUPERINTENDENT OF MAINTENANCE
S. B. CLEMENT, IN CONJUNCTION WITH MECHANICAL
DRAUGHTSMAN H. L. RODGERS.

The advisability of a change in the construction of freight and passenger cars from the generally used wooden type of car to that in which steel or metal should be the prevailing material, has been the subject of much consideration in railway circles during the past ten years, and it may be said that the T. & N. O. Ry. has been very much to the front amongst Canadian railroads in advocating and placing in service cars of this type of construction, as quickly as conditions under which the railway operates, and the progress being made in the design and manufacture of such cars made it possible to do so.

In 1906, the Commission, in view of the rapidly increasing freight traffic, decided that it would be necessary to make additions to their freight equipment which at that time was relatively small, and on December 21st of that year, instructed their officers having supervision over such matters to ascertain if it were possible to obtain freight equipment of steel construction from Canadian builders, also to submit report as to suitability such cars to the requirements of the T. & N. O. Ry.

It was found that but one concern, the Dominion Car and Foundry Co., of Montreal, not long organized, was in a position to tender on the building of steel equipment, and after investigation, report was submitted January 21st, 1907, advising that steel flat cars of 100,000 lbs. capacity be ordered. In accordance with this recommendation instructions were issued that specifications be prepared for such cars, and on May 28th, contract was let to the Dominion Car and Foundry Co. for 100 cars. These cars were delivered to the railway in September, and have given excellent results under such severe service conditions as obtained in log traffic and ballast service.

In view of the good results obtained in the case of the steel flat cars it was decided to continue the use of this material in future orders for freight equipment, and in May, 1908, contract was awarded to the Dominion Car and Foundry Co. for 50 box cars, 80,000 capacity, in which steel should be used for the underframe. Delivery of these cars was made in October.

In February, 1909, contract was given to the Dominion Car and Foundry Co., Montreal, for fifty steel underframe box cars of design and capacity similar to those purchased previously from this company, and which had proven very satisfactory. At the same Commission meeting, the Dominion Car and Foundry Co. were also given the contract to construct twelve steel cinder cars. Delivery of both the box and cinder cars were made in April, 1910.

In May, 1909, contract was awarded the Silliker Car Co., Halifax, for seven conductor's caboose cars, with steel underframing. These underframes the contractor had built at the Dominion Car and Foundry Co.'s works, Montreal, as up to this time this was the only Canadian car works equipped for this class of work. Delivery of these cars was made in October, 1909.

With the exception of four additional conductors vans of the same type, purchased this year from the Canadian Car and Foundry Co., Montreal, no further additions have been made to the freight equipment.

The results obtained from steel freight equipment has been very satisfactory. While there is no doubt but that they are somewhat more difficult to repair than the wooden underframe car, from the results obtained in reduced cost of maintenance due to ordinary service, deterioration and also their ability to withstand accidents very destructive to the wooden car, the Commission have been amply justified in their early decision as to the purchasing of freight equipment of this type.

In regard to the use of steel in passenger equipment, this matter is one which has been the subject of much consideration and investigation on the part of the officials of this road, at the instance of the Chairman of the T. & N. O. R. Commission particularly.

In 1906, whilst the subject of steel freight equipment was being considered, the Commission also directed that investigation be made in reference to the utilization of steel in the construction of passenger equipment, and in this connection a summary of the gradual progress which has been made in late years in this matter might be of interest.

It may be said that previous to the year 1902, but very little had been done along these lines. About this time, however, the necessity of providing passenger cars, in which the dangers attendant upon the use of wood in cars, from fire, to scoping and splintering in collisions, should be reduced to a minimum, began to be the subject of serious consideration amongst railway officials. Higher speeds, increase in length of cars and the longer trains, all combined to make the matter which certainly merited and received attention, it being always the object of railway companies to improve on their existing passenger equipment, wherever possible, in order to meet the increasing demands of the travelling public for safety as well as speed and comfort.

The matter of the substitution of steel for wood, however, was one which for obvious reasons moved somewhat slowly. Whilst a certain amount of useful experience had been obtained concerning the suitability of steel from its application to freight cars, in regard to the underframing, trucks, etc., difficult problems presented themselves in the designing and manufacture of the superstructure. Material such as for insulation, flooring, inside finish, etc., had to be provided and experimented with: designs required to be very carefully investigated in order to secure strength without undue increase in weight, also to facilitate such repairs as ordinarily provided and processes originated or improved upon in order to bring the costs of cars within reasonable figures.

In 1902 the Illinois Central Railway designed and built some cars for suburban services in which steel was used for the underframing and framing of the body, the remainder of the car being of wood. In the same year the Pressed Steel Car Co. of Pittsburg, designed a car in which steel was used for the underframing and trucks only, the entire body being similar to the usual wooden type.

This design, on being presented to the various railroad officials, met with considerable criticism, some being of the opinion that it fulfilled the requirements and others that although a step in the right direction, it did not go far enough. The change necessary required that not only the underframe, but also the superstructure should be of steel or material which would reduce the fire risk to a minimum.

In the early part of 1904 the Interborough Rapid Transit Co. had a subway car built in which, with the exception of some minor parts, steel was used entirely. This car in service developed some defects which experience remedied, and afterwards some 300 similar cars were purchased from the American Car and Foundry Co.

In 1904, the Pressed Steel Car Co. had built examples of v. found, however, using these cars, and "composed" as no more cars were built the general description.

In the late underframes and construction.

In June, the car in which experience obtained of metal to increase.

The Pennsylvania development of present have a encountered in later types of cars.

In 1906 a the Southern Railway.

In 1907 the turned out their number of such suggested. About St. Louis and San These cars have the body being pay being of the absolutely all metal reduced to the cost.

From this States; various of opinion in regard would appear practicability with 35,000 cars, 3,000 estimated that a of similar type.

To revert to Commission's recommendation after consideration, they were made sufficient in this direction for insulation trouble on the

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In 1904, a baggage car was constructed for the Erie Railroad Co. by the Stan-Steel Car Co., also postal and express car. These cars were probably the first examples of what is termed all steel construction in steam railroad service. It was, however, that continual complaints were being received from the employees of these cars, that they were too warm in summer on account of the heat trans-ferred by the steel plate, and also too cold in winter. The inside lining was removed and a "composite board" was substituted, which appeared to overcome the difficulty, and no more complaints on the above score were received. Shortly after these cars were built the same manufacturer constructed two mail cars of about the same general description for the New York, New Haven and Hartford Railway.

In the latter part of 1905 the Santa Fe built some postal cars with steel underframes and steel plate ends, the remainder being of the usual wooden construction.

In June, 1906, the Pennsylvania R.R. completed at its Altoona shops a sam-ple car in which steel was used to a very large extent throughout, and from ex-perience obtained with this car the officers of that road decided to extend the use of metal to include practically the whole body of the car.

The Pennsylvania has probably devoted more time and expense to the de-velopment of steel passenger coach than any other American road, and at the present have a greater number of such cars in service. Some difficulty has been encountered in regard to insulation against heat and cold, but, on the whole, their types of cars have been satisfactory.

In 1906 also the first steel cars were constructed for the Harriman lines at Southern Pacific shops.

In 1907 the Pullman Company, who had given the matter much attention, built out their first steel sleeping car, and have since constructed a considerable number of such cars with improvements, such as experience with the original car indicated. About the same period the Pullman Company delivered to the St. Paul and San Francisco equipment consisting of baggage, mail and express cars. These cars have steel underframes with steel frame superstructure, the remainder of the body being practically of wood, but cased with sheet steel, the railroad com-pany being of the opinion that it was unnecessary to go to the expense of an ab-solutely all metal car so long as the necessary strength was secured, and fire risk reduced to the extent that would be obtained with the above construction.

From this time forward much progress has been made on roads in United States; various types have been constructed, and while there are still differences of opinion in regard to the merits of all steel cars and cars of the composite type, it would appear that the trend of same is toward the use of metal in so far as feasibility will permit. At the end of the present year, out of a total of about 10,000 cars, 3,000 or over 5 per cent., are either all steel or steel framed, and it is estimated that about sixty per cent. of the orders placed for 1913 delivery will be of similar types.

To revert to the matter as pertaining to the T. & N. O. Ry. In reply to the Commission's request of December 1st, 1906, for data, etc., report was submitted after considerable correspondence with the few roads having such cars in service, they were of the opinion that the all steel passenger car building art had made sufficient advancement to warrant the T. & N. O. Ry. of taking any step in this direction, the main objection being that the difficulty of securing insulation of the car against heat and cold, which was the source of great trouble on United States roads, would certainly be much greater on the T. &

N. O. Ry., on account of the very low temperature obtaining along that line in winter, and that the cars so far built were mostly experimental, and the cost would be excessive, as it would be necessary to make considerable alterations to the existing designs in order to meet the conditions on this railway. It was recommended that in the meantime, pending further development, any new additions made to the T. & N. O. passenger train equipment should be of the composite type, i.e., they should be arranged with steel underframe and body frame, remainder to be of wood. This, while providing much additional strength, would not eliminate fire risk to any extent. It was thought, however, that until better methods were devised to cope with the insulation difficulties, this was as far as was possible to go.

In March, 1909, contract was let to the Preston Car and Coach Co. for an official car, in which this type of construction was embodied. This car was completed in August, 1910, and the first car built in Canada in which steel had been used to any great extent.

During the year 1909 the officials of the railroad, under instructions from the Commission to report what further developments had taken place, visited the railroads and manufacturing plants in the United States. The report presented stated that while considerable advancement had been made in regard to general design and the mechanical details, there had not been very much in the most essential to the T. & N. O. Ry., that of insulation, and as a result, it was decided to continue the construction previously decided upon for the official car for three parlor cafe cars, the contract for which being let February, 1910, to the Canadian Car and Foundry Co., Montreal.

In April, 1910, specifications embodying such features as were deemed desirable for T. & N. O. requirements were submitted for tenders. In reply many quotations were received, one from the Pressed Steel Car Co., Pittsburg, and one from the American Car and Foundry Co., Wilmington. The quotation from the Pressed Car Steel Co. was based on a type of car which they were building for a road in United States, and could not be considered, as this type of car was not suitable to the conditions on the T. & N. O. Ry.; that of the American Car and Foundry Co. was for \$27,000 per car, F.O.B. Wilmington.

It will be clear that this price is prohibitive, more so when freight and other charges are added, the price then being above \$34,000. The high cost the builders attributed to the fact that the number of cars to be ordered was small and considerably different in construction from the types they had built, much expense would be incurred in arranging drawings, patterns, dies, etc. The matter has been allowed to stand pending further developments, and in the intervening time has been followed up closely.

In March, 1912, a visit of investigation was made, and from what was ascertained it has been decided that it is now possible to arrange for cars at a reasonable price which will be suitable to the conditions on this railway. Specifications are now in course of preparation for mail and express, baggage, first and second class cars, so that if so desired the matter may be taken up quickly.

Officials of T. & N. O.
General Manager
Insurance
Statement—Per
Auditor's Report
Counsel's Report

Report of Chief Clerk
Elk Lake
Porcupine
Iroquois
James Bay
Grade Repairs
Accidents

Report—Motors
New Rolling Stock
New Equipment
Repairs to Locomotives
Repairs to Rolling Stock
Equipment

Report—Roadway
Maintenance
New Steel Rails
Rails Repaired
Cross Timbers
Switches
Sidings
Sidings
New Underframe
New Timbers
New Ties
Right of Way
Roadway
Public Buildings
Private Buildings
Cattle Catches
Ditching
Clay Catches
Fences
Ballast
Track
Rock Catches
Materials
Cinders
Materials
Materials
Summary

Report of 1st Assistant
General Manager
New Equipment
Water
Bridges
Telegraph
Mileage
Telephones
Accidents

ANNUAL REPORT OF CHIEF ENGINEER AND SUPERINTENDENT
OF MAINTENANCE

S. B. CLEMENT, C.E. & S. OF M.

Year Ending October 31st, 1913.

A. J. MCGEE, Esq.,

Secretary-Treasurer,

Toronto, Ontario.

DEAR SIR,—I beg to submit the following report on construction, maintenance of way and maintenance of equipment, for the year ending October 31st, 1913.

Construction

Elk Lake Branch:

At the beginning of the year the Elk Lake Branch was under construction, Messrs. McCaffrey & McQuigge having contracts for the grading and tracklaying. In December, 1912, all the grading on the branch was completed and track was laid to the Montreal River crossing. As there would be considerable delay waiting on the erection of the bridge across the Montreal River, and it was considered desirable to proceed with the tracklaying and ballasting from the Montreal River to Elk Lake immediately on the completion of the bridge, and operate a freight and passenger service from Earleton to Elk Lake, it was necessary to take the work out of the hands of the contractors. This was done and a regular service between Earleton and Elk Lake was inaugurated February 5th, 1913.

The tracklaying, ballasting and train-filling were completed by the Road Department. The section houses, tool houses, water stations, station buildings were built by the Bridge and Building Department. Sixteen miles of right of way was fenced by contract.

Elk Lake Branch Extension to Gowganda—Surveys:

In the years 1909 and 1910 an extension of the Charlton Branch had been located from Charlton to Elk Lake and thence to Gowganda. It was found that a more favorable location than this between Elk Lake and Gowganda could be obtained, and another location was made as an extension of the Elk Lake Branch. This location, leaving Elk Lake, follows the west branch of Bear Creek, keeping several miles to the south of the older location, and as regards length, grades, curvature and cost is more favorable.

The development of the Gowganda Mining Camp has not yet been sufficient to warrant the construction of this extension.

During the summer of 1913, Mr. W. R. Maher, one of the Commission's locating engineers, made a careful and complete reconnaissance of the area between Gowganda and Sudbury. Considerable prospecting has been done in certain sections, and the effect of the future development of mineral discoveries, on a railway location to best serve this area and provide a shorter connection between Sudbury and Gowganda and Temiskaming Districts, has been considered.

Iroquois Falls Branch:

A branch line of railway has been built from Porquis Junction on the main line to Iroquois Falls on the Abitibi River. The contract for clearing right of way was awarded the Abitibi Pulp and Paper Company, and the contract for grading to Messrs. MacDougall and McCluskey, Cochrane. Tracklaying and ballasting were done by Company forces. The length of the branch is $61\frac{1}{4}$ miles. From the Iroquois Falls terminus a private spur siding has been built to the Abitibi Pulp and Paper Company's mill, and will be operated and maintained by the Pulp Company.

The branch was so far completed as to permit the operation of a freight service on September 9th, 1913, and large quantities of material for the construction of the Company's plant have been handled.

James Bay Surveys:

The investigations the Commission had carried on at the mouth of the Moose River were continued. Mr. J. G. McMillan left Cochrane for Moose Factory in March, returning in August. His observations at the time of the spring floods were particularly valuable. A separate report has been published containing the results of Mr. McMillan's surveys and investigations at the estuary of the Moose River, and Mr. Maher's reconnaissance for a railway location between Cochrane and Moose Factory. The information contained in this report clearly indicates the nature of the work involved in the development of a harbor at Moose Factory, and the extension of the railway from Cochrane to Moose Factory.

ADDITIONS AND BETTERMENTS.

An independent track for passenger service has been constructed between North Bay Junction yard office and Canadian Pacific Railway passenger station, North Bay.

New passing sidings were constructed at Owaissa, capacity 70 cars, and Minaki, capacity 92 cars.

Spur sidings for accommodation of settlers in shipping pulpwood, were constructed at Nahma, Monteith (M.P. 217) and M.P. 133 $\frac{1}{4}$, Elk Lake Branch.

Nine new industrial sidings were constructed and four were extended.

18,796 feet or 3.56 miles of T. & N. O. Railway sidings and 4,823 feet or 0.91 miles of private industrial sidings were constructed during the year.

A new freight shed 30 ft. x 60 ft. was built at South Porcupine, and the local freight delivery tracks were moved to suit.

A new ice-house 25 ft. x 75 ft. was built at Cochrane.

A new water station is under construction at Minaki. Water stations at Widdifield, Tomiko and Timagami, were improved by removing pumps and boilers from the tank to independent buildings.

The passenger station and freight shed at Earleton were destroyed by fire. New and enlarged station and shed are now under construction.

A new frame Maintenance of Way Department store-house, 30 ft. x 150 ft., was built at North Bay Junction. This storehouse and adjoining storage yard provide excellent accommodation for all Maintenance of Way materials.

The telephone-train despatching system on the main line and Porcupine Branch was completed and placed in operation.

The long distance telephone system has been extended along the Elk Lake Branch from Earleton to Elk Lake, and the Kirkland Lake Mining Camp has been given a connection by means of a pole line from Swastika, a distance of six (6) miles. Connections have been made with the Timiskaming Telephone Company, at Cobalt, and New Liskeard, permitting the interchange of long distance business.

MAINTENANCE OF EQUIPMENT.

During the year the rolling stock and mechanical equipment have been fully maintained in serviceable condition. The accompanying report of the Master Mechanic shows in detail the nature and extent of all repairs. Considerable attention and study have been given the question of enlarging the general repair shops at North Bay. Plans for adequate extensions are now being prepared. The accompanying report of the Master Mechanic contains full statements of equipment in service and repairs to same during the year.

MAINTENANCE OF WAY.

As a result of the Commission's policy of making ample provision for maintenance and betterments, the permanent way has not only been maintained in serviceable condition, but very decided improvements have been made, and the permanent way has been brought to a standard that is very creditable to the management.

147,868 cross-ties and fifty-six sets of switch ties were used during the year for renewals.

22.33 miles of main track were relaid with new eighty-lb. steel rails. This track was originally laid in 1903 and 1904.

65,150 additional tie-plates were placed in the track.

17,717 lineal feet or 3.25 miles of tile under drains were laid to drain roadbed.

40.5 miles of main track were reballasted with 38,000 cubic yards of gravel ballast.

46.5 miles of main track were re-aligned with all curves to standard easements.

On thirty miles of track all ditches in clay cuts were cleaned and enlarged with steam ditcher.

9.56 miles of right of way fence were repaired and 7.7 miles of new fence were built.

1,490 lineal feet of timber trestle were replaced by embankment.

Large timber trestles at Boston Creek and Wild Goose Creek are now being replaced by heavy steel viaducts.

The complete reports of the General Roadmaster, Bridge and Building Master, and Supervisor of Telegraphs, are attached. These contain full details of all work undertaken during the year by the Road Department, Bridge and Building Department, and Telegraph and Telephone Department.

Respectfully submitted,

NORTH BAY, ONTARIO,
December 13th, 1913.

S. B. CLEMENT, C.E. & S. OF M.

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ACCIDENTS.

The following is a list of personal injuries relating to Departments under my jurisdiction, occurring during the year:

1912.

November 5th, R. G. Reid, freight car carpenter, at North Bay Junction, while changing bits in a wood boring machine, was badly cut.

December 19th, Wm. Harvey, sectionman at M.P. 178.8, jumped from a hand car and broke a rib in his left side.

1913.

January 18th, Wm. Drolet, chore boy at Iroquois Falls, while getting water for the boarding camp from tender of engine No. 105, slipped and fell off the tender, sustaining slight injuries.

January 24th, A. Dicnicola, sectionman at Matheson, was slightly injured in hip by a piece of coal falling from a passing engine.

February 14th, John Greco, temporarily employed as watchman at Montreal River Bridge, was slightly burnt in the face by a falling cinder.

February 26th, R. W. Beddingfield, steam shovel cranesman, was struck in the ankle by a piece of frozen gravel and slightly injured.

February 22nd, Robert McKay, hostler assistant, North Bay Junction, fell off a tender and sprained his ankle.

March 1st, George Smart, machinist, North Bay Junction, had two fingers crushed in gears of machine in motion.

April 3rd, F. Galluccio, sectionman, Timagami, had his left eye slightly injured by a small piece of flying steel.

April 9th, Frank Alberta, laborer, North Bay Junction, was injured in fleshy part of leg by a piece of steel flying from a cold sett.

April 25th, George Gray, sectionman, New Liskeard, had two fingers of right hand caught between switch point and stock rail, making amputation of both at first joint necessary.

May 3rd, C. M. Stokes, carpenter, North Bay, while fighting fire on roof of Bagshaw Station, fell and hurt his head and shoulder.

June 12th, Olen Kexrine, sectionman, North Bay, fell off a moving hand-car and was slightly injured.

June 19th, M. Sammon, carpenter, North Bay, while helping to tear down a trestle on the Kerr Lake Branch, had his collar bone broken by being struck with a piece of timber.

June 21st, M. Borswell, laborer, at ballast pit, was cut under the eye by a piece of steel flying from a wedge.

In order to supply sufficient steam to heat long passenger trains, engines Nos. 133, 134, 135, and 136 have been equipped with 1½ in. steam heat throttle and 2 in. regulator. The necessary repairs to steam heat equipment on all locomotives and cars have been made as they pass through the shops for repairs.

All pressure gauges have been tested when necessary and when engines pass through the shops for general repairs. The adjustment of all locomotive safety valves has been maintained at the authorized boiler pressure throughout the year.

Summary of Extensive Repairs to Locomotives:

Since November 1st, 1915, the following locomotives have been through our shops at North Bay Junction, for repairs:

Given General Repair:—114, 115, 116, 121, 122, 124, 132, 136, 150, 153.

Given Heavy Repair:—103, 104, 105, 112, 131, and 135.

Given Light Repair:—101, 103, 106, 113, 140. In addition engines 101, 115, 118, 119, 127, 133, 136, 139 and 140 were in the shop at different times during the year for extensive repairs due to accidents.

Note: The term "Heavy Repair" as applied above refers to cases where an engine has received such repairs as driving tyres turned, driving boxes renewed, valves, piston rings and side rod bushings renewed. "General Repair" refers to cases where an engine has been given a thorough overhauling and rebuilt. "Light Repairs" refers to cases where an engine has received minor repairs such as renewal of side rod bushings, piston rings and valve rings.

Each engine has had the boiler washed out once every two weeks when in regular service. Stay bolts in fire boxes have been regularly tested and renewals made when necessary. Nettings and ash pans and dampers have been examined at the end of each trip during the summer as a precaution against fire. During damp weather, and at such times as the danger from this source is reduced to a minimum, ash pans and dampers have been examined twice a week.

Engine Despatch:

Statement showing the number of engines despatched from different terminal and divisional points during the year:—

Station.	Number of Engines despatched.
North Bay Junction	5,111
Elk Lake	439
Englehart	4,941
Iroquois Falls	344
Timmins	800
Cochrane	1,888
Total	13,523

The motive power has been generally assigned during the year as follows:—

Class of Service.	Number of Engines.
Passenger	13
Freight	22
Work	3
Switching	5

Locomotive Mileage:

The following statement shows mileage made by locomotives belonging to this railway during the year:—

Engine No.	Miles Run.
101	31,498
103	34,577
104	35,286
105	33,798
106	32,474
107	33,090
108	39,122
109	42,951
110	12,941
111	36,763
112	35,482
113	37,979
114	29,769
115	29,926
116	15,339
117	21,692
118	23,629
119	33,936
120	35,910
121	15,656
122	24,231
123	36,733
124	41,583
125	29,115
126	43,202
127	41,900
128	42,526
129	39,684
130	23,224
131	16,368
132	16,709
133	43,347
134	49,656
135	36,703
136	64,447
137	54,802
138	51,353
139	50,382
140	52,066
150	29,944
151	31,293
152	11,389
153	21,872
	<hr/>
	1,464,347

Repairs to Passenger Equipment:

Extensive repairs have been made to passenger equipment at North Bay Junction shops as follows:—

Class of Car.	General Repair.	Light Repair.
First Class	3	9
Second Class	1	4
Baggage and Express	1	3
Mail and Express .....	..	4
Combination	1	1
Parlor Cafe Cars .....	..	2

Bills have been rendered against foreign roads for repairs to cars which were repaired under rules adopted by the Master Car Builders' Association. In addition to this monthly bills have been rendered against the Grand Trunk covering the cost of repairs to such cars as are governed by the Grand Trunk running rights agreement at actual cost of labor and material, plus 10 per cent.

Snow plows and snow flangers, wrecking cranes, steam shovels, etc., have been overhauled and given such repairs as were necessary. During the forest fire on July 29th, the "American" railroad ditcher was badly damaged by fire, necessitating the rebuilding of all superstructure on the car and extensive repairs to the ditcher itself. The Ledgerwood rapid unloader which was being used in conjunction with the ditcher at the time of the fire was also badly damaged, the car on which the Ledgerwood was built being completely destroyed.

Steel Tyres Turned and Wheels Applied Rolling Stock:

During the year forty pair of driving tyres, one pair of idler wheels, ninety-eight pair of coach wheels, eight pair of new coach tyres, forty pair of tender wheels, twenty-one pair of engine truck wheels and two pair of new engine truck tyres have been turned on wheel lathe at North Bay Junction.

The following tyres were bored out before being applied to wheels: Forty-nine driving wheel tyres, twenty-eight coach wheel tyres, two tender wheel tyres, and fourteen engine truck wheel tyres.

At Englehart 1912 car wheels have been pressed off axles, new wheels bored and remounted on axles.

New wheels have been applied to rolling stock on the T. & N. O. Railway as follows:—

To Locomotives:

7	pairs	33"	C.I.	wheels	on	3½ x 7"	axles.
44	"	"	"	"	"	5 x 9"	"
1	"	"	"	"	"	5½ x 10"	"
5	"			Schoen	steel	tender	wheels.
36		57"		driving	tyres.		
14		28"		engine	truck	tyres.	
2		69"		driving	tyres.		
6		63"		driving	tyres.		

To Passenger Equipment:

28	36"	steel	tyres.
64	pr.	wheels	changed and tyres turned.

To Freight Equipment:

21	pairs	new	33"	C.I.	wheels	on	4½ x 8"	axles.
2	"	S.H.	"	"	"	4½ x 8"	"	
1	"	new	"	"	"	5 x 9"	"	
17	"	new	"	"	"	5½ x 10"	"	

To Ballast Cars:

16	pairs	new	33"	C.I.	wheels	on	4½ x 8"	axles.
2	"	S.H.	"	"	"	4½ x 8"	"	
31	"	new	"	"	"	5 x 9"	"	
1	"	S.H.	"	"	"	5 x 9"	"	

To Van, Work and Other Service Equipment:

17	pairs	new	33"	C.I.	wheels	on	3½ x 7"	axles.
1	"	S.H.	"	"	"	3½ x 7"	"	
5	"	new	"	"	"	4½ x 8"	"	
3	"	new	"	"	"	5½ x 10"	"	

The term "General Repair" as applied above refers to cases where a coach has had the interior scraped and sanded, sashes removed and refitted, mouldings removed and replaced in interior of car, seats removed and replaced, outside sheathing stripped off, panels removed, side of coach trussed and replanked, piers strengthened, letter board removed and replaced, vestibule ends reinforced with iron plates, trucks rebuilt, transoms and sills and trimmers renewed, journal boxes and brasses renewed and wheels turned.

The term "Light Repair" refers to coaches having seat arms scraped and sanded, interior of car varnished, outside of car washed down and given two coats of varnish, trucks repaired.

While first class coaches were undergoing general repairs the following alterations and betterments were made to the construction of the cars: Two steel sills applied, two extra wooden sills, new friction buffers and draft gear, vestibule curtains and tail gates. The baggage and express cars were equipped with steel sills, new friction buffers and draft gears.

Parlor cafe cars "Sesekinika" and "Tetapaga" have each been equipped with electric lighting system of the Safety Car Heating and Lighting Company's underframe type with Edison storage batteries. In addition these two cars have also been fitted with Commonwealth steel trucks, which is now the railway company's standard truck for all steel and steel underframe passenger equipment.

About the first of the year private car "Sir James" was put in the shop, thoroughly cleaned down and given a coat of varnish. Outside of this no repairs have been necessary with the exception of the ordinary running repairs. Car "Abitibi" was taken into the shop during July of this year and after receiving a thorough cleaning was re-leaded, hard stopped, sandpapered, colored, lettered and varnished.

Coach Cleaning:

Statement showing the number of coaches cleaned at the different stations during the year:—

Station.	Number of Coaches Cleaned.
North Bay Junction	2,818
Englehart	972
Cochrane	2,681
Timmins	1,390
Elk Lake	732
Iroquois Falls	732
Total	9,325

Repairs to Conductors' Vans:

During the year six conductors' vans have been put through the shop and have received a thorough overhauling and repair, including repainting of interior and exterior.

Repairs to Freight and Work Equipment:

During the past year our staff at North Bay Junction have rebuilt two flat cars, applied new sills to forty-seven flat cars, and have redecked fifty flat cars. In addition to this 574 T. & N. O. freight cars, 2538 T. & N. O. coaches and 21,840 foreign freight cars have been repaired on repair track.

To Foreign Cars:

	6 pairs new 33" C.I. wheels on	3½ x 7" axles.
5	" S.H.	" " 3½ x 7" "
1,418	" new	" " 4½ x 8" "
105	" S.H.	" " 4½ x 8" "
348	" new	" " 5 x 9" "
16	" S.H.	" " 5 x 9" "
146	" new	" " 5½ x 10" "
6	" S.H.	" " 5½ x 10" "

Rolling Stock Destroyed:

During the destructive fire which swept Northern Ontario during the month of July, 1916, ninety-four cars belonging to foreign roads were burned on the tracks of the T. & N. O. Railway.

In addition to this the following foreign cars were destroyed at different points, along the line: G. T. R. 46935 by wreck at Trout Mills; C. G. R. 19249 by wreck at Latchford; C. G. R. 60550 by wreck at M.P. 212; G.T.R. 61602 and 69081 by wreck at Rabbit Creek Pit; G. T. P. baggage car 422 by fire at Cobalt.

Such trucks and other material from above cars as were in serviceable condition were returned to the owners and balance of cars are being settled for at depreciated value in accordance with regulations laid down by the Master Car Builders' Association.

Of the T. & N. O. freight equipment, ten steel flats and four wooden flats were burned in the fire during July. In addition to this five flat cars and two vans have been destroyed by wreck on our own line, while one stock car, one box car and one flat car have been destroyed on foreign roads. Bills have been rendered against the foreign roads covering depreciated value of cars destroyed on their line, less value of servicable material returned, as per M. C. B. rules.

Work Turned Out of Carpenter Shop:

The following miscellaneous articles have been manufactured and turned out of carpenter shop at North Bay Jct., in addition to material for repairs to rolling stock:

2 tables.
3 tables repaired.
2 line posts.
6 section posts.
6 fence posts turned up.
3 filing cabinets.
2 small cabinets for oil samples.
2 stationery cabinets.
1 drawing board.
1 office stool repaired.
1 case for oil lamp.
48 rollers turned up.
1 ledger cabinet.
1 cabinet for time sheets.
1 set pigeon holes.
1 sleigh tongue repaired.
3 correspondence trays.
2 extension boxes.
1 cupboard for machine shop.
1 ice box for Cochrane.
25 office chairs repaired.
2 barrel skids repaired.
29 baggage trucks repaired.
2 new office desks.
4 office desks repaired.

9 conductors' kit boxes.
4 yard limit boards.
6 step ladders.
3 ladders.
15 gang planks.
67 mile boards.
1 picture frame.
1 meter box for ice house.
3 signboards.
2 bulletin boards.
2 wheelbarrows repaired.
150 notice frames.
298 transfer cases.
600 vent plugs for battery boxes.
508 bottom blocks for batter boxes.
770 rungs for ladders.
100 flanger boards.
30 wing boards.
1,000 grade stakes.
1,000 centre stakes.
234 sections cattle guards.
452 slats for repairs to cattle guards.
229,736 track shims.

MOTIVE POWER AND CAR DEPARTMENT.

S. B. CLEMENT, Esq.,
C. E. & S. of M.

DEAR SIR,—Beg to submit the following report of the Motive Power and Car Department for the year ending October 31st, 1917.

New Locomotives:

In November, 1916, the Canadian Locomotive Company, Limited, Kingston, delivered the remaining four "Mikado" type locomotives on the contract of March, 1916. A general description of these engines was included in the annual report of the Motive Power and Car Department for 1916.

During the year that these locomotives have been in service they have proven very satisfactory.

Alterations and Repairs to Locomotives:

With the view of effecting all possible economy in the matter of fuel consumption, it has been the intention for some time to proceed with the installation of superheaters, brick arches, etc., on the older types of locomotives. All the engines built for the road since 1909 have been equipped with these devices which have thoroughly proven their merit.

Owing to labor conditions and volume of other work it has been impossible to go ahead with these changes at our shops here.

The matter has been taken up with the different locomotive manufacturers and the Canadian Locomotive Company have undertaken the work of equipping eight ten-wheel engines with these appliances, and at the same time, give these engines a complete overhauling.

New Freight Cars:

In May, contract was given the Canadian Car and Foundry Company, Limited, for 100 box cars, delivery of same to be made towards end of this year. These are to be 36'-80,000 lbs. capacity cars with steel framing and single sheathing. They will be equipped with Arch Bar trucks, friction draft gear, and inside metal roofs.

New Conductor's Caboose Cars:

During May, June and July, the Preston Car and Coach Company delivered the six caboose cars on their contract of June, 1916.

These cabooses are the T. & N. O. standard type, 29' long over end sills with steel underframes and equalized pedestal trucks.

New Machine Tools:

The following machinery has been added to the equipment of the Machine Shops at North Bay Junction:

One No. 6, type B, pneumatic hammer; one 200-ton electric hoist; one centering machine; one 24-inch shaper; one 8-inch power hack saw; one tube cleaning machine; one safe end machine; one tube welding furnace; one combination hot saw and tube expanding machine; one tube welding machine; one No. 02 stationary forge; one 5-ton hand travelling crane; one oil and waste reclaiming outfit, consisting of one 20-inch waste machine and one 15-inch centrifugal oil separator.

Summary of Extensive Repairs to Locomotives:

Since November 1st, 1916, the following locomotives have been through our shops at North Bay Junction for repairs:—

Given General Repair:—106, 108, 124, 131, 133, 137, 138, 150, 151.

Given Heavy Repair:—101, 111, 113, 117, 119, 123, 130, 134, 135, 136.

Given Light Repair:—106, 109, 123, 127, 133, 139, 145.

Note: The term "General Repair" as applied above refers to cases where an engine has been given a thorough overhauling and rebuilt. Heavy repair refers to cases where an engine has received such repairs as driving tires turned, driving boxes renewed, valves, piston rings, and side rod bushings renewed. Light repair refers to cases where an engine has received minor repair such as renewal of side rod bushings, piston rings and valve rings.

All requirements of the Dominion Railway Commission in regard to washing out and testing boilers, testing stay-bolts, examining nettings and dampers, etc., have been fully complied with, and during the summer months periodical inspection of all fire protective appliances on engines has been made by a Government Inspector.

Engine Despatch:

Statement showing the number of engines despatched from different terminal and divisional points during the year:—

Station.	Number of Engines Despatched.
North Bay Jct.	6,315
Elk Lake	391
Englehart	4,391
Iroquois Falls	362
Timmins	773
Cochrane	1,745
Total	13,977

The motive power has been generally assigned during the year as follows:—

Class of Service.	Number of Engines.
Passenger	15
Freight	28
Work	2
Switching	4

Locomotive Mileage:

The following statement shows mileage made by locomotives belonging to this railway during the year:—

Engine No.	Miles Run.
101.....	24,762
103.....	28,294
104.....	8,184
105.....	24,643
106.....	22,751
107.....	21,539
108.....	22,528
109.....	34,109
110.....	27,030
111.....	19,908
112.....	36,387
113.....	30,356
114.....	25,203
115.....	12,164
116.....	9,794
117.....	22,900
118.....	26,484
119.....	24,292
120.....	6,702
121.....	33,357
122.....	36,032
123.....	26,858
124.....	7,917
125.....	31,895
126.....	21,617
127.....	31,046
128.....	37,552
129.....	16,334
130.....	15,362
131.....	2,637
132.....	16,603
133.....	33,876
134.....	32,569
135.....	53,216
136.....	48,777
137.....	31,306
138.....	22,534
139.....	26,683
140.....	27,227
141.....	35,249
142.....	33,092
143.....	46,601
144.....	32,509
145.....	39,445
146.....	37,979
150.....	30,579
151.....	28,098
152.....	20,130
153.....	35,635
1,320,745	

Repairs to Passenger Equipment:

Extensive repairs have been made to passenger equipment at North Bay Junction shops as follows:—

Class of Car.	General Repair.	Light Repair.
First Class	1	8
Second Class	1	10
Baggage and Express		3
Mail and Express	1	3
Parlor Cafe Cars	1	1

NOTE.—The Term "General Repair" as applied above refers to cases where a coach has had the interior and exterior finish of car removed, framing refitted, and trucks rebuilt.

The term "Light Repair" applies to coaches having seat arms scraped and sanded, interior of car varnished, outside of car washed down and given two coats of varnish; trucks repaired.

Each first and second class coach given a general repair has been equipped with steel side sills, extra wooden sills, new friction buffers and draft gear, vestibule curtains and tail gates. The mail and express cars have been equipped with steel sills, new friction buffers and draft gear.

Parlor cafe car "Wasaksima" is now in the shop undergoing general repairs, and is being equipped with electric lighting system of the Safety Car Heating and Lighting Company's make with Edison storage batteries.

In addition to the above the official car "The Whitney" has been given a general repair and equipped with Commonwealth Company's cast steel six-wheel trucks, thus making all six-wheel passenger car trucks in use on this railway of one standard type.

Coach Cleaning:

Statement showing the number of coaches cleaned at the different stations during the year:—

Station.	Number of Coaches Cleaned.
North Bay Junction	2,878
Elk Lake	628
Englehart	1,198
Timmins	1,441
Iroquois Falls	628
Cochrane	2,493
Total	9,266

Repairs to Conductor's Vans:

During the past year fourteen of our conductor's vans have been through the shop for general overhauling and repairs.

Repairs to Freight and Work Equipment:

The staff maintained on freight car repair work in Carpenter Shop at North Bay Junction has rebuilt 17 flat cars, made heavy repairs such as new sills, new decking, trucks overhauled, and etc., to 34 flat cars, 5 box cars, and one stock car. On the repair track 28 flat cars have had new sills applied and 15 cars have been redecked. In addition to this, 814 T. & N. O. freight cars, 2,717 coaches and 18,678 foreign cars have been repaired and released from repair track at North Bay Junction.

Bills have been rendered against foreign roads for repairs to cars under rules adopted by the Master Car Builders' Association. Monthly bills have also been rendered against the Grand Trunk Railway for repairs to cars under terms and conditions of Grand Trunk Running Rights Agreement.

All work equipment such as snow ploughs, snow flangers, wrecking outfits, steam shovels, and boarding cars, etc., have been overhauled and given such repairs as were required to keep them in serviceable condition.

At different times during the year our wrecking outfit has been loaned to outside companies for which proper bill has been rendered in each instance.

Steel Tyres Turned and Wheels Applied Rolling Stock:

During the year forty-four pairs of driving wheels, one pair of trailing truck wheels, eighty-one pairs of coach wheels, forty-three pairs of tender wheels, thirty-one pairs of engine truck wheels, and sixteen pairs of street car wheels have been turned at North Bay Junction.

The following new tyres were applied to wheels: Thirty-four driving wheel tyres, twenty engine truck tyres, eight tyres for street car wheels.

One thousand four hundred and seventy-eight cast iron wheels have been pressed off axles, new wheels bored and mounted on these axles.

Sixty-nine pairs of wheels have been changed under passenger equipment and bad tyres turned.

New wheels have been applied to T. & N. O. freight and work equipment as follows:—

14 pairs new 33" C.I. wheels on $3\frac{3}{4}$ x 7" axles.
1,242 pairs new 33" C.I. wheels on $4\frac{1}{4}$ x 8" axles.
636 pairs new 33" C.I. wheels on 5 x 9" axles.
255 pairs new 33" C.I. wheels on $5\frac{1}{2}$ x 10" axles.

Rolling Stock Destroyed:

We are glad to report that there have been no serious wrecks and little heavy damage to rolling stock on our line during the past year. T. & N. O. coach No. 112 was destroyed by fire at Englehart, January 14th, 1917; C. & N. W. 114746 by wreck at M.P. 153 $\frac{1}{2}$, February 7th, 1917; D. P. & I 5154 by wreck at M.P. 222, February 25th, 1917; B. & S. 11346 by wreck at South Gillies, August 3rd, 1917.

In each case of foreign cars destroyed we have settled with owners for depreciated value of cars in accordance with Master Car Builders' regulations.

Seven of our flat cars and two steel underframe box cars have been destroyed on foreign lines and bills have been rendered against such companies covering depreciated value of cars, less value of serviceable parts returned, as per Master Car Builders' rules.

Work Turned Out of Carpenter Shop:

In addition to the regular work in connection with repairs to passenger, freight and work equipment, considerable miscellaneous work has been done in the carpenter shop for other departments, such as dressing lumber, making window framing and stair banisters, conductor's kit boxes, ladders, tool chest, notice frames, gang planks, transfer cases, standard explosive blocking, spot boards, hand sleighs, snow scrapers, flanger markers, station sign boards, bulletin boards, time table racks, barrel skids, repairs to office chairs, desks, cabinets, and platform trucks.

Equipment Owned:

45 road locomotives.	1 combination wooden first-class and baggage car.
4 switching locomotives.	1 exhibition car.
2 private cars.	3 parlor cafe cars.
2 business cars.	5 wooden baggage and express cars.
13 first-class wooden coaches.	4 steel baggage and express cars.
6 first-class steel coaches.	5 wooden mail and express cars.
14 second-class wooden coaches.	3 steel mail and express cars.
4 second-class steel coaches.	26 conductor's vans.
2 combination wooden second-class and baggage cars.	9 stock cars.
	143 box cars.

Pit—Continued.

Sidings Laid and Extended.

Location	Description.	Purpose.	Length.
North Bay	Extension carpenter shop siding No. 10	Car repairs...	107
	" " " No. 11	"	33
	" " " No. 12	"	107
	Boarding car storage spur	Car storage..	1,100
M. P. 24½	Cinder dump spur	Cinders	550
	Pit sidings, extended	Ballast	198
	" " " "	"	1,406
M. P. 58½	Milne & Sons siding, extended (Milnes per- formed work)	Lumber	251
M. P. 73.7		General	217
Cassidy	Through siding, extended	Ballast	280
Earlton Jct.	Old pit siding, extended	General	754
	New through town siding	"	1,402
M. P. 18½ Elk Lake Branch	Elk Lake branch main line extended to new station	"	1,402
	Good's private spur extended to through sid- ing for public use	"	438
Chamberlain	Through siding extended	"	207
M. P. 153½	Public spur, Boston Creek	"	349
Dane	Pit sidings, extended	Ballast	1,176
Porquis Jct.	Mechanical coaling plant siding, partially laid	Coaling engs..	450
Nellie Lake	Water tank spur, extended	Watering engs.	29
M. P. 233	Public Spur	General	578
M. P. 245½	Public spur, extended	"	362
Cochrane	T. C. R. Connection east of station	"	366
	T. C. R. Connection at diamond crossing	"	325
Iroquois Falls ..	Transfer siding No. 1	"	2,872
	" " No. 2	"	1,390
	" " No. 3	"	1,152
M. P. 11 Porcupine Sb-Dv.	Coal spur at A. P. & P. Co. mill, extended	Coal Storage ..	175
	M. Holgevac's spur	Pulp	251
M. P. 23	Crawford & Levinson's spur	"	277
Timmins	Marshall-Ecclestone, Ltd., spur	Supply	528
	Tail of "Y," extended for Hollinger Mines Co.	Mining	99
	Main Spur, Hollinger Mining Co.	"	2,079
	Short Spur, " "	"	417
			20,025
20,025 feet			3.79 miles.

Sidings Shortened and Taken Up.

Location	Description.	Purpose.	Length
Greys	Old Temagami Mining & Milling Co., spur taken up	Mining	1,211
Rib Lake	Gillies Bros., log spur; taken out	Lumbering	2,103
Haileybury	Freight shed spur, shortened	General	265
New Liskeard ..	McChesney's spur, taken out	Lumbering	306
Earlton Jct.	Old town spur, shortened	General	694
M. P. 153½	Temporary bridge spur, taken out	Bridge Cons'n.	300
M. P. 175	Sesikinika Lumber Co., spur, taken out	Lumbering	255
Cochrane	Temporary coal dump spur, taken out	Coal Storage..	450
	Connection to T. C. Rly. at east end of yard. shortened	General	280
Porcupine	Town siding, taken out	"	950
Timmins	Coal chute, siding, removed	Coaling	400
			7,214
7,214 feet			1.37 miles.

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MOTIVE POWER AND CAR DEPARTMENT.

Annual Report for Year ending October 31st., 1915—Thos. Ross,
Master Mechanic.

Shops.

Alterations have been made to the coach and carpenter shops at North Bay Junction, which have effected considerable improvement therein. Coach shop has now capacity for six coaches, with space for painters, upholsterer, storage, etc., whilst the addition to the woodworking machine shop has enabled us to locate the different machinery to much better advantage from the standpoint of efficiency and safety.

New Rolling Stock.

In June, 1915, contract was awarded to the Pullman Company for the construction of two steel baggage and express cars and two steel first class coaches, delivery to be made during the latter part of November, 1915.

The baggage and express cars are to be similar in all respects to those built in 1914. The two first class coaches, while of the same general construction as those at present in service, are to have a few minor alterations, as follows: A smoking compartment to seat sixteen persons; single 50 watt centre lamps; floor covered throughout with linoleum. For test purposes one car is being equipped with the Stone Company's axle generator and the other with the Safety Company's "Underframe" type generator; Edison batteries being used on both cars.

Arrangements are being made to equip the two steel second class cars, Numbers 221 and 222, with smoking compartments.

Official Car "Temagami":

The remainder of the work on the official car "Temagami" was finished in August, this car now being of practically all steel construction, with the exception of part of the interior finish.

Tank Cars for Fire Protection:

In June, 1915, four tank cars numbered 101, 102, 103 and 104, were purchased from the Imperial Oil Company, Sarnia, Ont. These cars have each been equipped with force pump, hose, pails, axes, shovels, etc., and are located at different points along the line, under the supervision of the section foremen, to be used for fire protection purposes at out-stations.

Electrical Work:

The transmission line to the carpenter shop at North Bay Junction has been rebuilt and a power circuit put in. The installation of electric drive for carpenter and machine shops together with the rewiring of paint shop and the installation

- 1 motor driven compressor repaired.
- 66 distributing valves repaired and tested.
- 69 compressor governors repaired and tested.
- 81 engine brake valves repaired and tested.
- 144 feed valves cleaned, repaired and tested.
- 191 safety valves cleaned, repaired and tested.
- 47 air gauges repaired and tested.
- 34 locomotive steam gauges repaired and tested.
- 33 steam heat gauges repaired and tested.
- 29 steam heat regulators repaired and tested.
- 49 air signal equipments repaired and tested.
- 57 driver brake cylinders cleaned, oiled and tested.
- 255 angle cocks and cutout cocks repaired and tested.
- 36 funnel cocks for coaches repaired and tested.
- 30 bell ringers repaired and tested.

Also conductors' valves, retainer valves, steam heat regulators for coaches, slack adjusters, strainer checks, etc., have been repaired and tested as required.

Summary of Extensive Repairs to Locomotives:

Since November 1st, 1914, the following locomotives have been through our shops at North Bay Junction for repairs:—

Given heavy repair: 103, 104, 105 (twice), 108, 116, 118, 125, 129 (twice), 132, 138, 133.

Given general repair: 106, 107, 108, 109, 113, 123, 124, 125, 126, 128, 134, 135 and 151.

In March, 1915, engine 134 was returned from Kingston after being converted from simple to superheated engine. This is the last of the four Pacific type engines on which this alteration has been made. From the increased tractive power and decreased fuel consumption, this alteration has proved to be an economical investment.

During the year three engines belonging to Angus Sinclair, Contractor, of the C. N. R. construction, were put through our shops at North Bay Junction. Engine No. 607 was given a general rebuild. Engine No. 1012 was thoroughly overhauled, including new cab and running boards applied, tender frame straightened and reinforced, tender tank patched, and all new piping on engine. Engine No. 1107 had wheels removed and tyres turned besides other light repairs. Bills have been rendered against the contractor covering the cost of the above repairs.

Note: The term "Heavy Repair" as applied above, refers to cases where an engine has received such repairs as driving tyres turned, driving boxes renewed, valves, piston rings and side rod bushings renewed. "General Repair" refers to cases where an engine has been given a thorough overhauling and rebuild.

Each engine has had the boiler washed out once every two weeks when in regular service. Staybolts in fire boxes have been regularly tested and renewals made when necessary. Nettings, ash pans and dampers have been examined at the end of each trip during the summer, as a precaution against fire. During damp weather and at such times as the danger from this source is reduced to

Motive Power Department:

The increases in rates of pay for machinists in the Motive Power Department that became effective May 1st, 1916, vary from 5.6 per cent. to 9.1 per cent.

The other trades in the Motive Power Department, not included in the schedule, subsequently received very substantial increases, varying from 7.8 per cent. to 32.5 per cent., and now receive the new Canadian Pacific Railway rates for similar trades at North Bay.

Car Department:

The increases in wages of Car Department employees became effective July 1st, 1916, and vary from 6.1 per cent. to 25 per cent.

Maintenance of Way Department:

The employees of the Maintenance of Way Department asked for increases of approximately 18 per cent. to 20 per cent. on their existing schedule, and are now actually receiving various increases. These have not been formally accepted by the organization. It is believed that an early settlement will be reached.

The demands of the munitions factories have made it extremely difficult to obtain deliveries of certain classes of materials. The Munition Board demands that the requirements of plants working on war orders receive preference. This makes it necessary that our orders be reduced, but we are co-operating with the rolling mills as closely as possible.

Forest Fires.

The accompanying map shows the areas in the vicinity of Matheson and Cochrane burned over in the forest fires of July. The fires appear to have been burning for some weeks around the settlers' clearings near the railway before the strong gale of July 29th united them in a huge conflagration extending from Ramore to Nellie Lake and travelling in a southeasterly direction at a rate variously estimated at from 25 to 40 miles an hour. Similar conditions obtained at Cochrane where the front of the fire was about eight miles in a north and south direction and the course was almost due east.

At Nahma the fire travelled north-east but did not extend far beyond the track. While the fire swept over the entire area shown, the damage to the timber in different sections varied greatly. Where there was any slashing or windfalls, the standing trees were entirely destroyed. In places where there is little undergrowth the trees are generally fire killed but not damaged very badly for lumber or pulp. In some thinly timbered areas the larger trees are not even killed, though there are places as at Nushka where even large whitewoods are burned down, and throughout the whole area a great deal of additional loss has occurred through trees being uprooted by the wind after the covering had been burned off the roots.

In any estimate of the damage to the forest it must be noted that on a very large percentage of the area burned over this year, the timber had been destroyed by previous fires, notably by those of 1905 and 1911. And on these old "brules" the conditions for settlement have been greatly improved by the lessening of the labor required to clear the land, and by the removal, though at a deplorable cost, of further danger to life and property by fire.

The villages of Matheson, Nushka and Kelso and a number of smaller settlements were completely destroyed. Several hundred settlers were rendered homeless and two hundred and twelve people perished.

So intense was the fire that it is marvellous that anything within the area it covered was not consumed. Through good fortune and the strenuous efforts of our employees, who made great use of one of the Commission's tank cars, all the railway buildings at Porquis Junction were saved. This break in the fire saved the greater part of the village of Porquis Junction, the fire burning only a few buildings at its northern end.

The following railway structures were burned:

Location	Buildings	Construction
Belleek	Shelter station	Frame
Matheson	Station	Stone
	Freight shed	Frame
	Section house No. 1	Frame
	Wood shed No. 1	Frame
	Section house No. 2	Frame
	Wood shed No. 2	Frame
Nushka	Tool house	Frame
	Tool house	Frame
	Section house	Frame
	Wood shed	Frame
	Shelter station	Frame
Kelso	Station and freight shed	Frame
Wicklow	Wood shed	Frame
	Section house	Frame
	Tool house	Frame
Cochrane	Freight shed	Frame
Iroquois Falls	Tool house	Frame
	Oil house	Frame
	Engine shed and bunk house	Frame

A portion of the deck of the Wataybeag River Bridge and a number of timber culverts were burned and have been renewed.

The Commission also suffered a heavy loss through the destruction of fences, ties, rails and other Maintenance of Way material and tools, including:

Fence—1,600 rods destroyed.
 Ties, 8'—11,320 destroyed; 1,775 damaged.
 Ties, switch sets—5½ sets destroyed.
 Rail—9,533 feet destroyed; 2,033 feet damaged.
 Sundry track materials.
 Track tools (contents of tool houses burned.)

The loss of rolling stock was as follows:

Location	Number of cars
Belleek	16
Matheson	6
Nushka	2
Siding, M. P. 216.6	2
Wataybeag pit	1
Kelso	10
Siding, M. P. 226.8	2
Siding, M. P. 245.5	1
Cochrane	2

Amongst other items the equipment of these locomotives includes the following: Westinghouse E.T. 6 air brake, with 8½ inch, cross compound pump, Pyle National electric headlight equipment type E, Commonwealth Steel Co.'s cast steel rear frame extension and trailing truck, Vanadium steel main frames, these being five inches wide, Vanadium steel springs throughout on engine and tender, Franklin Railway Supply Co.'s No. 8, pneumatic fire doors, Franklin Railway Supply Co.'s power grate shakers, and Franklin Railway Supply Co.'s automatic driving box wedges.

Two of the engines have been equipped with Mudge Slater arrangement on front end and one engine with Oliver Boyer speed recorder.

In the design of these engines, in order to reduce maintenance charges to the minimum, consideration has been given to standardizing as many parts as possible with those of the Consolidation type freight locomotives, which were of about the same tractive power, and which have proven very satisfactory in service.

With the completion of the delivery of the remaining four engines on this contract, the motive power equipment of this railway will be as per the following statement:—

Wheel Arrangement.	Number.	Average Weight on Driving Wheels.	Average Tractive Power.
Loo00	2	56,500 Lbs.	13,240 Lbs.
Loo000	29	112,270 "	23,600 "
Loo000o	4	133,375 "	30,400 "
Lo0000o	6	197,000 "	45,500 "
Lo0000	4	182,000 "	42,600 "
L000	4	123,250 "	28,160 "
Total	49	Weight on drivers. 6,225,330 Lbs.	Tractive Power. 1,288,520 Lbs.

New Passenger Cars:

In January, two new steel baggage and express cars and two new first class steel coaches were received. These cars were built by the Pullman Co., and are practically duplicates of the all-steel passenger equipment built at a previous date by the Pullman Company for this Railway.

Work Equipment:

In May, eighteen 80,000 lb. capacity Hart cars and one Jordan ballast spreader were received. These are second-hand equipment, purchased through F. H. Hopkins, Montreal, and had been used on the National Transcontinental Railway, but were in very good condition.

Tank Cars:

As a further protection against fires along the railway, two additional second-hand tank cars have been purchased and equipped with pumps, hose, and fire tools.

Electrical Work:

The electric drives for carpenter and machine shops at North Bay Junction have been completed, as also has the re-wiring of the paint shop and the installa-

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Tractive Power. 1,288,520 Lbs.

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North Bay Junction
op and the installa-

tion of electric lights in the new carpenter shop. Electric lights have been installed in new wheel and blacksmith shop and work in connection with complete installation of power and light service is in hand for all new shops at North Bay Junction. Arrangements are also in progress for installation of electric hoist for use in ice house.

The equipments on all steel cars have been thoroughly overhauled, which includes the dismantling, washing and repairing of all cells.

Headlight equipments on locomotives and snow plows have been maintained in good condition, and in the cases of engines undergoing general repairs, the whole electrical equipment has been completely overhauled and repaired.

The work necessary for the upkeep of lights, etc., at the various stations along the lines where electricity is used has been done and arrangements made for the lighting of buildings now being erected or that have been completed.

Air Brake Equipment:

During the year the air brake running repairs at all divisional points, and all general repairs and renewals to T. & N. O. and N. C. R. air brake equipment have been carried out in accordance with the recommended practice.

In addition to the above the following work has been executed by the Air Brake Department:—

A train air signal testing rack equal to a locomotive and twelve modern passenger cars has been added to the air brake testing equipment. This will enable us to thoroughly test out and adjust all train air signal equipment before being placed in service.

To eliminate moisture from the compressed air and deposit it in the main reservoir on the locomotive, engines 121, 122, 114, 115, 131, 132, 133, 135, 136, 150, 153, have been equipped with between 35 and 45 ft. of $1\frac{1}{4}$ in. cooling pipe, located between the compressor and the main reservoir, and the same amount of equalizing pipe has been placed between the main reservoir.

Records obtained during the past winter of engines thus equipped show freezing took place between the compressor and engineer's brake valve, indicating that efforts to apply proper piping to prevent moisture getting into brake pipe was made in the right direction.

Combination car No. 14 has been equipped with L-N brake, high speed beams, and new foundation brake gear. This completes the installation of high speed brake on all passenger equipment.

New foundation brake gear has been applied to cafe cars "Sesekinika" and "Tetapaga," and the air brake equipment has been rearranged to conform to the Commonwealth steel trucks.

New standard foundation brake gear has been installed on engine 121. This will give more track clearance and uniform shoe wear.

The air appliances for operating snow plows and flangers have been overhauled and put in good condition for the coming winter.

The compressed air water distributing equipment on passenger cars has been maintained in satisfactory condition, and all necessary repairs and renewals made as cars pass through shops for general repairs.

The following car brakes have been cleaned, oiled, tested and stencilled:

- 139 passenger car brakes.
- 295 freight car brakes.
- 18 van brakes.
- 16 miscellaneous car brakes.
- 115 freight car brakes by T. & N. O. Ry. for foreign lines.
- 131 T. & N. O. freight car brakes by foreign lines.

In order to supply sufficient steam to heat long passenger trains, engines Nos. 133, 134, 135, and 136 have been equipped with 1½ in. steam heat throttle and 2 in. regulator. The necessary repairs to steam heat equipment on all locomotives and cars have been made as they pass through the shops for repairs.

All pressure gauges have been tested when necessary and when engines pass through the shops for general repairs. The adjustment of all locomotive safety valves has been maintained at the authorized boiler pressure throughout the year.

Summary of Extensive Repairs to Locomotives:

Since November 1st, 1915, the following locomotives have been through our shops at North Bay Junction, for repairs:

Given General Repair:—114, 115, 116, 121, 122, 124, 132, 136, 150, 153.

Given Heavy Repair:—103, 104, 105, 112, 131, and 135.

Given Light Repair:—101, 103, 106, 113, 140. In addition engines 101, 115, 118, 119, 127, 133, 136, 139 and 140 were in the shop at different times during the year for extensive repairs due to accidents.

Note: The term "Heavy Repair" as applied above refers to cases where an engine has received such repairs as driving tyres turned, driving boxes renewed, valves, piston rings and side rod bushings renewed. "General Repair" refers to cases where an engine has been given a thorough overhauling and rebuilt. "Light Repairs" refers to cases where an engine has received minor repairs such as renewal of side rod bushings, piston rings and valve rings.

Each engine has had the boiler washed out once every two weeks when in regular service. Stay bolts in fire boxes have been regularly tested and renewals made when necessary. Nettings and ash pans and dampers have been examined at the end of each trip during the summer as a precaution against fire. During damp weather, and at such times as the danger from this source is reduced to a minimum, ash pans and dampers have been examined twice a week.

Engine Despatch:

Statement showing the number of engines despatched from different terminal and divisional points during the year:—

Station.	Number of Engines despatched.
North Bay Junction	5,111
Elk Lake	439
Englehart	4,941
Iroquois Falls	344
Timmins	800
Cochrane	1,888
Total	13,523

The motive power has been generally assigned during the year as follows:—

Class of Service.	Number of Engines.
Passenger	13
Freight	22
Work	3
Switching	5

TEMISKAMING AND NORTHERN ONTARIO RAILWAY.

MOTIVE POWER AND CAR DEPARTMENT.

Annual Report for Year ended October 31st, 1916—Thos. Ross,
Master Mechanic.

New Locomotives:

In March, 1916, contract was awarded the Canadian Locomotive Company, Kingston, for the construction of six "Mikado" type locomotives, delivery of same to be made in October. Up to the end of October two of these engines have been received, and the following is a general description of same:—

Weight on driving wheels, pounds	197,000
Weight on leading truck, pounds	29,900
Weight on trailing truck, pounds	32,000
Weight, total of engine, pounds	258,900
Weight of tender loaded, pounds	146,000
Wheel base, driving, feet and inches	16-6
Wheel base, total of engine, feet and inches	34-8
Wheel base, total of engine and tender, feet and inches	63-4 3/4
Cylinder, diameter and stroke, inches	25 by 30
Valves, type and diameter, inches	Piston 14 in.*
Valve gear, type	Walschaert*
Wheels, diameter of driving, inches	63
Wheels, diameter of truck, inches	33
Wheels, diameter of trailing, inches	45
Wheels, diameter of tender, inches	36
Journals, main driving, diameter and length, inches	10 by 13
Journals, other driving, diameter and length, inches	9 by 13
Journals, truck, inches	6 1/2 by 12
Journals, trailing, inches	7 by 14
Journals, tender, inches	5 1/2 by 10
Boiler, type	Extended wagon top
Boiler, pressure, pounds	180
Boiler, outside diameter at front end, inches	71
Boiler, outside diameter at dome course, inches	78
Firebox, length inside sheets, inches	96
Firebox, width inside sheets, inches	75 1/4
Tubes, number and diameter, inches	202-2
Tubes, length, feet and inches	20-0
Flues, number and diameter, inches	32-5 3/8
Arch tubes, number and diameter, inches	4-3
Heating surface, firebox, square feet	208
Heating surface, arch tubes, square feet	28
Heating surface, tubes and flues, square feet	3,016
Heating surface, total, square feet	3,252
Superheating surface, square feet	757
Grate area, square feet	50.1
Water, capacity of tender, U. S. gals.	7,000
Coal, capacity of tender, tons	12
Maximum tractive power, pounds	45,500
Factor of adhesion	4.32

*One engine equipped with "Young" valve gear and "Young" piston valves,

Amongst other items the equipment of these locomotives includes the following: Westinghouse E.T. 6 air brake, with 8½ inch, cross compound pump, Pyle National electric headlight equipment type E, Commonwealth Steel Co.'s cast steel rear frame extension and trailing truck, Vanadium steel main frames, these being five inches wide, Vanadium steel springs throughout on engine and tender, Franklin Railway Supply Co.'s No. 8, pneumatic fire doors, Franklin Railway Supply Co.'s power grate shakers, and Franklin Railway Supply Co.'s automatic driving box wedges.

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In May, eighteen 80,000 lb. capacity Hart cars and one Jordan ballast spreader were received. These are second-hand equipment, purchased through F. H. Hopkins, Montreal, and had been used on the National Transcontinental Railway, but were in very good condition.

Tank Cars:

As a further protection against fires along the railway, two additional second-hand tank cars have been purchased and equipped with pumps, hose, and fire tools.

Electrical Work:

The electric drives for carpenter and machine shops at North Bay Junction have been completed, as also has the re-wiring of the paint shop and the installa-

ANNUAL REPORT OF CHIEF ENGINEER AND SUPERINTENDENT OF MAINTENANCE, T. & N. O. RAILWAY.

Year ended October 31st, 1917.

W. H. MAUND, Esq.,

Secretary-Treasurer,

Toronto, Ontario.

DEAR SIR,—I beg to submit the following report of the Engineering, Maintenance of Way and Mechanical Departments of the Temiskaming and Northern Ontario Railway, for the fiscal year ended October 31st, 1917.

Mileage and Equipment.

There has been no change in the main track mileage, but a considerable increase in the mileage of tracks, railway sidings and private sidings.

Operated by the Commission:

	Oct. 31, 1917.	Oct. 31, 1916.
First Track	328.50 miles	328.50 miles
Second Track	1.70 "	1.70 "
Yard Tracks and Sidings	99.84 "	98.31 "
Private Sidings	14.21 "	10.44 "
	<hr/> 444.25 "	<hr/> 438.95 "

Leased to Grand Trunk Railway:
Nipissing Junction Spur

2.10 " 2.10 "

Leased to Nipissing Central Railway:

Main Track	10.45 "	10.45 "
Yard Tracks and Sidings	1.65 "	1.65 "
Private Sidings	1.03 "	1.16 "
	<hr/> 13.13 "	<hr/> 13.26 "

Details of all track changes are shown in statements included in this report.
The equipment owned by the Commission consists of the following:—

	Oct. 31, 1917.	Oct. 31, 1916.
Locomotives	49	43
Passenger Cars	65	66
Freight Cars	593	620
Work Cars	107	89

Surveys and Construction.

Kirkland Lake Branch:

Surveys for the location of a branch line to serve the Kirkland Lake Gold Camp have been made. The proposed branch will connect with the main line at Swastika. The location that has been selected passes close to all producing mines and the more promising prospects. It will be six miles long, and as the country through which it passes is comparatively rough, and as the traffic will probably never be very heavy, grades of 1.5 per cent. and curvature up to 12° were used,

permitting the cost of construction to be kept within reasonable limits. At the beginning of the fiscal year when the survey was made, it was estimated that the cost of construction would be \$125,000, and this amount was included in the Legislative Estimates.

The present is not an opportune time to commence any large engineering undertaking, as through the scarcity of labour and materials, the cost will be greatly in excess of that under normal conditions. The Commission has, however, closely watched the development of this promising camp and, as the necessary surveys have been completed, the branch can be placed under construction without delay, as soon as a decision to build is made.

Main Line Revision:

In the last report mention was made of three proposed revisions of the main line, viz:—

Mileage 54	—55
" 63	—66.5
" 80.8	—81.2

The grading of the first of these was partially completed during the year 1916-17, the work being done by the Road Department forces.

This year tenders were called for the grading of the other revisions, those of Mileage 63—66.5 and 80.8—81.2, and the following is a comparison of the tenders received:—

Item.	Quantity.	Bourke & McGuinty.	Port Arthur Construction Company.	Jones Girouard & Company.	Dominion Construction Company.	Henderson & Angus, W.A. Cockburn and Lindsay & McCluskey
		Unit price.	Unit price.	Unit price.	Unit price.	Unit price.
		\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Clearing.....	24 acres ..	60 00	60 00	80 00	90 00	80 00
Close Cutting.....	1 acre ...	45 00	75 00	60 00	40 00	150 00
Grubbing.....	2 acres ..	200 00	150 00	200 00	200 00	175 00
Solid Rock.....	20,600 c.y.	1 94	1 70	1 75	1 85	2 40
Loose	4,000 "	75	75	80	75	80
Common Exc.....	50,000 "	54	35	40	40	60
Overhaul	50,000 "	01	01	01	01	01
Telegraph poles cut on R. of W.	Each	1 00	1 00	3 00	1 00	50
Fence posts cut on R. of W.	"	10	10	10	15	05
Ties cut on R. of W.	"	20	25	28	20	20
Timber cut on R. of W. per 1000 ft. B.M.	.....	15 00	8 00	10 00	2 50	8 00
Concrete						
1:2:4.....	Per c.y...	15 00	13 00	12 00	14 00	10 00
1:3:5.....	66 " "	15 00	12 00	10 00	13 00	9 50
Cast Iron Pipe						
12in. Dia.	20 lin. ft.	25	1 00	25	60	15
Concrete Pipe						
24in. Dia.	45 lin. ft.	75	1 25	75	2 00	50
36in. Dia.	180 " "	1 00	1 50	1 50	2 50	50
Total tender based on estimated quantities.....	.....	73,557 75	58,973 25	63,098 75	65,620 00	86,302 50

The lowest tender accepted and a formal contract. The contractors have made but good progress has been made Mileage 63 to 66.5, and grading on both divisions.

During the year tenders which were required for the important of these in the

North Bay Junction

The enlargement of the end of the last fiscal year. Brick Extension on Brick Extension. New Frame Blast cleaning machines.

New Frame Blast brickwork, a contract. The following

An electric motor. All concrete for smith shop.

A new oil and Kaustine lavatory at coach shop, while

Mileage 14.26. Mileage 30.76 bankment.

Mileage 40.9.—Company, who was siding is now being

Mileage 43.7.—siderable lumber is them at Mileage 43

Mileage 45.25 Pulp and Paper Company. Mileage 52.81 bankment.

Mileage 93.25 3 T.R.

ble limits. At the estimated that the as included in the

large engineering s, the cost will be ission has, however, i, as the necessary onstruction without

visions of the main

ted during the year

er revisions, those of arison of the tenders

	Dominion Construction Company.	Henderson & Angus, W.A. Cock- burn and Lindsay & McCluskey
--	--------------------------------------	---

ce.	Unit price.	Unit price.
c.	\$ c.	\$ c.
00	90 00	80 00
00	40 00	150 00
00	200 00	175 00
75	1 85	2 40
80	75	80
40	40	60
01	01	01
00	1 00	50
10	15	05
28	20	20
00	2 50	8 00
00	14 00	10 00
00	13 00	9 50
25	60	15
75	2 00	50
1 50	2 50	50
3 75	65,620 00	86,302 50

The lowest tender, that of the Port Arthur Construction Company, was accepted and a formal contract was entered into by the Commission and the Company. The contractors have experienced great difficulty in obtaining the necessary labour, but good progress has been made on the larger of the two diversions, that between Mileage 63 to 66.5, over half of the grading having been completed. All of the grading on both diversions should be completed by July 1st, 1918.

Additions to Road and Equipment.

ROAD.

During the year efforts were made to carry on as fully as possible those works which were required for the betterment of the Commission's property. The more important of these improvements and additions are:—

North Bay Junction:

The enlargements of the locomotive repair shops, under construction at the end of the last fiscal year were completed as follows:—

Brick Extension at east end of Machine Shop, 52' 9" x 85' 6".

Brick Extension on north side Machine Shop, 25' x 100'.

New Frame Blacksmith Shop, 30' x 80', with an annex 20' x 27' to house flue cleaning machines.

New Frame Wheel Shop, 30' x 80'.

This work was all done by the Bridge and Building Department, except the brickwork, a contract for which was awarded W. A. Martyn, North Bay.

The following additions were commenced and completed during the year:—

An electric motor hoist for handling the ice in ice house.

All concrete foundations for new machine tools for machine shop and blacksmith shop.

A new oil and waste reclaiming plant building 12' x 18'.

A combined Car Department Stores Building and Blacksmith Shop 17' x 80', also scrap rubber house 10' x 30', with enlargement of scrap bins and platforms.

Kaustine lavatories were installed in the Master Mechanic's office building and at coach shop, while a large one is now being installed for the machine shop.

Mileage 14.26.—Timber culvert replaced by a 24" concrete pipe.

Mileage 30.76.—Beam culvert replaced by a 36" concrete pipe and embankment.

Mileage 40.9.—A spur siding 767' long was put in for the Pembroke Lumber Company, who were taking out a large quantity of logs east of Diver. This siding is now being moved to Mileage 42.8.

Mileage 43.7.—The McNamara Lumber Company are also taking out considerable lumber in this vicinity. A spur siding 964' long was constructed for them at Mileage 43.7 and another 828' long at Mileage 46.7.

Mileage 45.25.—A spur siding 780' long was built for the Spanish River Pulp and Paper Company for handling pulpwood.

Mileage 52.81.—Open beam culvert replaced by a 30" concrete pipe and embankment.

Mileage 93.25.—A spur siding 622' long was built for Mr. G. C. Smith.

New Liskeard Spur:

A 12' open beam culvert was constructed on this spur.

Uno Park:

A freight shed 30' x 30' was constructed to take care of the growing business at this station.

A kaustine lavatory was installed in the Agent's residence.

Mileage 120.4.—A spur siding 300' long is being built to provide facilities for the shipment of forest products.

Earlton Junction:

Two stock pens 35' x 40' were built to take care of the requirements of this growing farming centre.

Leeville:

A standard frame shelter 10' x 30' was built for the accommodation of passengers waiting for trains at this stop.

Mountain Chutes:

The standard frame shelter at Three Nations station on the Porcupine Branch was moved to this flag stop.

Englehart:

In August last a portion of one of the tenement houses was destroyed by fire. Our forces made the necessary repairs, also put concrete floors in the basements and installed sewer and water systems.

A car foreman's office and shop 20' x 36' was built, also a hard coal shed 14' x 18' for storing coal for the passenger cars.

Mileage 148.—A spur siding 239' long was built for Thomas Woollings. It is expected that a considerable quantity of forest products will be shipped from this point.

Mindoka:

A spur siding 282' long was built at this place.

Mileage 153.—A spur siding 425' long was built at this point to serve the mining district to the east of the railroad.

Mileage 162.3.—The filling of this trestle was completed.

Swastika:

To increase the facilities for handling the traffic in coal at this station a trestle was built so that the cars could be unloaded without delay and the coal hauled away later. In this connection a spur siding 432' long was built.

Mileage 181.3.—The timber trestle at this point is being replaced by a 55' steel span and embankment.

Bourkes:

A freight shed 25' x 25' and an employee's camp 14' x 18' were built at this station.

Vimy Ridge:

The standard completion of the

Matheson:

The fire of Matheson. At the with the exception brick, all the work

Nushka:

A standard fire of July 2

Monteith:

A frame freight To serve the agent's residence Van Rassel Bros received:—

6 inch Tile Dra

Contracto

Van Rassel Bros., C Henderson and Ang J. P. Quinlan, North D. Barker & Co., No T. N. Colgan, North

Kelso:

A standard fire of July 2

Porquis Junction

A considerable of labour the pro ditional sidings this important j seven switches in were lengthened

Nahma:

The section been rebuilt by

Vimy Ridge:

The standard frame shelter at Connaught was moved to Vimy Ridge on the completion of the new station at the former place.

Matheson:

The fire of July 29th, 1916, destroyed all the Commission's buildings at Matheson. At the close of last fiscal year these had all been completely rebuilt with the exception of the stone passenger station. The station was rebuilt with brick, all the work being done by our own forces.

Nushka:

A standard frame shelter 10' x 35' was built to replace the one destroyed in the fire of July 29th, 1916.

Monteith:

A frame freight shed 20' x 30' was built by our own forces. To serve the needs of this growing community a frame station 25' x 45', with agent's residence included, is being built by contract, the successful tenderers being Van Rassel Bros. of Cochrane. The following is a comparison of the tenders received:—

6 inch Tile Drain, Wooden Platform, Total Cost of Work included in Specification.

Contractor.	Lump sum price.	Cemented joints.	Open joints.	Cedar mudsills.	Pine joists and planking.	Tenders.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Van Rassel Bros., Cochrane.....	6,550 00	452 00	81 00	190 40	1,061 50	8,334 90
Henderson and Angus, North Bay.	8,437 00	367 25	81 00	57 12	1,158 00	10,100 37
J. P. Quinlan, North Bay.....	8,350 00	452 00	94 50	238 00	1,061 50	10,196 00
D. Barker & Co., North Bay.....	8,800 00	395 50	87 75	190 40	1,061 50	10,535 15
T. N. Colgan, North Bay	7,033 00	423 75	98 55	95 20	965 00	8,615 50

Kelso:

A standard frame shelter 10' x 35' was built to replace the one destroyed in the fire of July 29th, 1916.

Porquis Junction:

A considerable enlargement of this yard was started, but owing to the shortage of labour the programme as laid out was much curtailed. However, sufficient additional sidings were provided to greatly increase the traffic handling facilities of this important junction point. A total of 5,618 lin. ft. of sidings was laid and seven switches installed. Besides the tracks laid, the culverts, wherever necessary, were lengthened and other improvements made.

Nahma:

The section house and tool house destroyed by the fire of July 29th, 1916, have been rebuilt by our own forces.

Cochrane:

Three camps, each 18' x 34' were built for the employees of the Motive Power and Car Department.

Suitable lunch counters, refrigerators and other necessary equipment, having been installed in the station restaurant, it was opened and operated by the lessee Mr. Arthur Stevens, effective August 1st, 1917.

A transfer siding 2,224' long was built for the interchange of traffic between the T. & N. O. and C. G. Railways.

Car repair tracks are now under construction.

Jacinto:

A standard frame shelter 8' 6" x 12' was built.

Iroquois Falls:

The engine shed destroyed in the fire of July 29th, 1916, was rebuilt.

A bunk-house 18' x 24' was built for the employees of the Motive Power and Car Department.

The four semi-detached tenement houses under construction at the end of last year were completed.

A 40' extension was built to the west end of the freight shed and 25' of the east end of the building made into freight offices.

Lavatory fixtures and drainage system was put in the station and electric light systems installed in the station and the dwelling houses.

A great deal of work was done in fixing roadways on the station grounds and improving the grounds.

To handle the ever increasing business from the mill of the Abitibi Power and Paper Company, another transfer siding 836' long was installed by the Commission and a coal unloading spur 616' long was built for the company.

Connaught:

Connaught, situated on the Frederick House River, is rapidly developing into a very important point for the shipping of forest products.

The St. Maurice Lumber Company has erected a large mill for the rossing of pulpwood, and constructed a siding 5,630' long from Barber's Bay along the old lake bottom to serve their plant.

Reamsbottom & Edwards have also completed a large mill for rossing pulpwood and have constructed two spurs, one 1,360' and the other 1,005' long to serve their plant.

Owing to the growing importance of the shipping from this point, a combined station and freight shed 25' x 65' has been erected.

A one storey frame agent's dwelling 22' x 42' 6", and a sectionmen's bunk-house 14' x 18' have been built.

On September 12th last the pumphouse was destroyed by fire. A new one has been built on a more suitable site.

Mileage 11.0, Porcupine Branch.—A spur siding 262' long was put in for the Monteith Pulp and Timber Company.

Hoyle:

At Hoyle the mill on the bank of t
A spur siding 1,132'

Mileage 18.4, P
Forbes for the hand

Pymms:

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Contracts for
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a high standard
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Hoyle:

At Hoyle the Porcupine Pulp and Lumber Company has erected a large mill on the bank of the Porcupine River for the handling of pulpwood and lumber. A spur siding 1,132' long was installed to serve the mill.

Mileage 18.4, Porcupine Branch.—A spur siding 247' long was built for J. M. Forbes for the handling of forest products.

Timmins:

The new brick passenger station, under construction at the end of last year, was completed by the contractors, Messrs. Henderson & Angus, North Bay. The old frame station was moved to a more suitable site and is now used exclusively as a freight shed and office.

In connection with the change of location of the freight shed, additional sidings were provided as follows:—

No. 1	Freight Shed Track	—438' long.
No. 2	" " "	—360' "
No. 1	Team Track	—712' "
No. 2	" " "	—768' "
No. 3	" " "	—439' "

Except where otherwise noted, all the above additions were made by the Commission's forces.

Equipment.

The Mechanical Department has suffered similarly from the scarcity of labour and materials, and despite the most strenuous efforts to relieve it there has grown an accumulation of repairs to rolling stock. At the beginning of the fiscal year six new Mikado locomotives were received from the Canadian Locomotive Works, Kingston. These were of the greatest assistance in handling the traffic during the year. Arrangements are now being made to have a number of the older locomotives repaired at an outside shop to relieve the situation. At the same time these locomotives will be equipped with superheaters and other modern devices that will largely increase their efficiency.

In the accompanying report of the Master Mechanic will be found a very complete statement showing the amount and character of repairs that have been made to rolling stock.

Maintenance of Way.

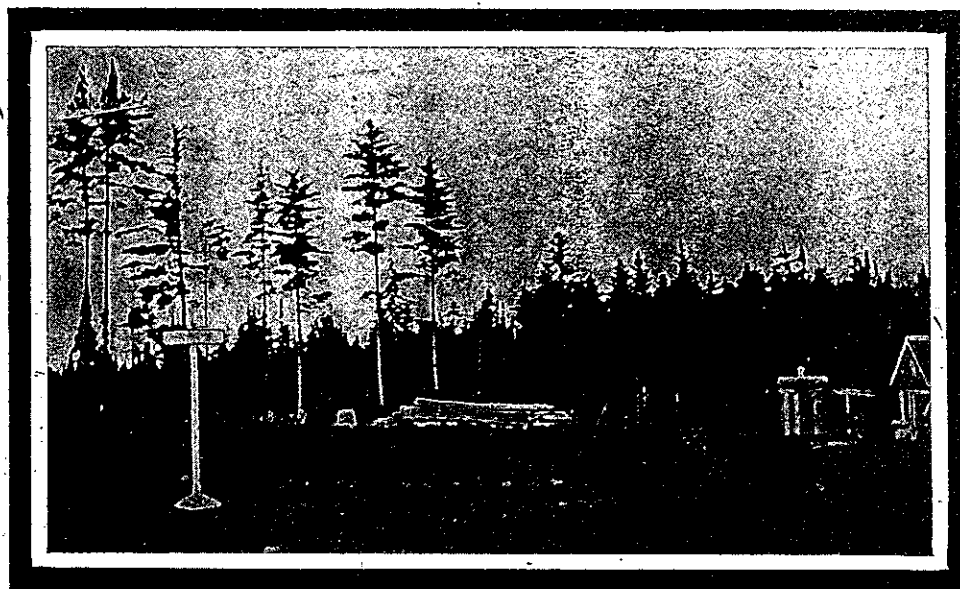
In the last annual report reference was made to the increasing scarcity of labour and difficulty in obtaining materials required for repairs and renewals. During the present year these difficulties greatly increased. It may be truly said that at no time in the past have the railways of Canada been confronted with the conditions they are meeting at present.

It has been necessary to greatly curtail the progress of maintenance of way work that was laid out, and in many respects only the absolutely essential work could be performed.

Contracts for rails, ties and other track material required for current renewals had been made, but the contractors failed to fill their contracts, and it was necessary to make only partial renewals of rails and ties. The Commission's policy of a high standard of maintenance in former years has enabled it to meet the present conditions without serious deterioration of the track and roadbed.



Standard Section Foreman's Dwelling, T. & N. O. Railway Commission, Otter, Ontario.



Potato Patch at Section Foreman's Dwelling, Otter Station, Ontario.

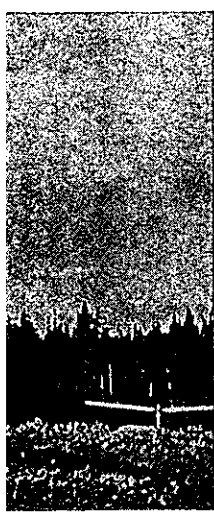
Private Sidings:

The following statement includes all private sidings laid or extended during the year:—

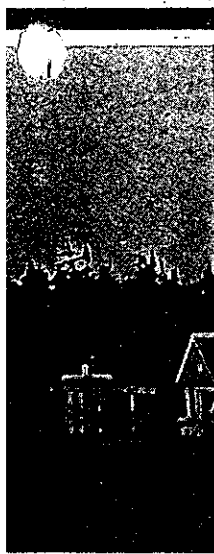
Location.	Name.	Length.	Remarks.
<i>Main Line:</i>		Feet.	
Trout Mills	Wm. Milne & Son	494	Lumber yard.
Mile 40.9	Pembroke Lumber Co.	767	For loading logs.
" 43.7	McNamara Lumber Co.	964	" "
" 45.25	Spanish River Pulp & Paper Co..	780	For loading pulpwood.
" 46.7	McNamara Lumber Co.	828	For loading logs.
Doherty	Port Arthur Construction Co....	294	Handling contractors' supplies.
Mile 66.25	" "	460	Handling contractors' supplies.
" 93.5	G. C. Smith	622	For handling forest products.
" 148	Thomas Woollings	239	For handling forest products.
<i>Iroquois Falls Branch:</i>			
Iroquois Falls	Abitibi Power & Paper Co.	616	For handling coal.
<i>Porcupine Branch:</i>			
Barber's Bay	St. Maurice Lumber Co.	5,630	To serve rossing plants.
Connaught	Reamsbottom & Edwards	1,360	" "
"	"	1,005	" "
Mile 11.0	Monteith Pulp & Timber Co.	262	For loading forest products.
Hoyle	Porcupine Pulp & Lumber Co....	1,132	For loading forest products.
Mile 18.4	J. M. Forbes	247	For loading forest products.
Total		15,700	

The following includes all private sidings removed or shortened:—

Location.	Name.	Length.	Remarks.
<i>Main Line:</i>		Feet.	
Tomiko	Ferguson & McFadden	7,821	Balance of mill yard sidings.
Mile 40.9	Pembroke Lumber Co.	767	
" 105.5	McCamus & McKelvie	253	
Total		8,841	



mission, Otter, Ontario.



tion, Ontario.

Meeting, Yard and Loading Sidings:

The following new sidings or extensions to existing sidings have been constructed to provide increased facilities at different points:—

Location.	Description.	Length.
		Feet.
Halleybury Spur	N. C. R. Main Line to Transfer Siding	203
Heaslip	Through Town Siding	746
Mindoka	Loading Spur	282
Mill 153	Public Spur	425
Porquis Junction	No. 1 Through Siding, East of Main Line	3,682
	No. 2	1,521
	Cross-over, Main Line to No. 1 Siding above	179
	Cross-over, Main Line to Iroquois Falls Branch	286
Cochrane	Transfer to T. C. R.	2,224
Iroquois Falls	Additional Transfer Siding	836
	Total	10,334

The following public or railway sidings were taken up or shortened:—

Location.	Description.	Length.
		Feet.
North Bay Junction	Rip Track shortened	180
Latchford	Town Siding taken up	399
Kerr Lake	No. 1 Through Siding taken up	730
Porquis Junction	Through Siding on West shortened	132
	Total	1,441

Tie Renewals:

Track ties were renewed as follows:—

	Main Track.	Sidings.	Private Sidings.	Total.
First Division	26,401	3,694	20	30,115
Second Division	25,801	1,185	50	27,036
Kerr Lake Branch	1,221			1,221
Elk Lake Branch	388			388
Charlton Branch	2,818	72		2,890
Porcupine Branch	2,191	13	80	2,284
Iroquois Falls Branch				
Total				63,934

Twenty-six sets of

The following table for four years, shows a decrease in last two years. This and labour to put the construction have been distributed from year to

Fiscal Year.	Ma
	Total.
1914	87,259
1915	87,948
1916	72,480
1917	52,202

Ballasting:

Owing to the sh

Rail Renewals:

The rail renewa

Mileage 72 to 76—
Mileage 76 to 79

Miscellaneous

Timber trestle replaced
Concrete tile used for
Corrugated iron
Tile drain to underd
Embankments restored
total of
New right-of-way fence
Public road crossings
Private road crossings

in order to give effect to the proper rates, the Board orders that the company be permitted to publish a supplement to its tariff C.R.C. 3003, so as to give effect to the proper rates on cheese, the said supplement to be made effective upon one day notice.

Railway Rolling Stock Orders and Deliveries.

on cheese from stations in Canada to the Atlantic seaboard, for export. Upon it appearing that an error had been made in the publication of commodity rates on cheese, by transposition of the rates for immediate correction being necessary.

Act, 1919, for approval of its Standard Freight Mileage Tariff, C.R.C. no. 646. Michigan Central Cheese Rates.

30,920. April 23.—Re application of Michigan Central Rd. for permission to publish, on one day notice, revised rates

The Timiskaming & Northern Ontario Ry. is in the market for several cabooses. The estimates for the year ending Oct. 31, 1922, submitted to the Ontario Legislature recently, include \$150,000 for the four switching locomotives which the Railways and Canals Department has ordered from Montreal Locomotive Works, as mentioned in our last issue, will be used in construction work on Welland Ship Canal.

W. W. Butler, President, Canadian Car & Foundry Co., and W. H. Woodin, a director of that company and President of Foundry Co., received the following rolling stock concerns.

Canadian National Ry., between Mar. 5 and Apr. 9, received the following rolling stock:

ing stock; 140 stock cars, completing an order for 350; 17 sleeping cars, completing an order for 18, and 20 baggage cars, completing an order for that number,

from Canadian Car & Foundry Co.

The G.T.R., during February and March, received the following additions to rolling stock:

from its Montreal shops; 840 automobile cars, 80,000 lb. capacity, and 50 baggage cars, 80,000 lb. capacity, from Canadian Car & Foundry Co.; and 42 automobile cars, 80,000 lb. capacity, from American Car & Foundry Co.

The C.P.R., between Feb. 11 and Apr. 13, received the following additions to rolling stock:

160 refrigerator cars from its Angus shops, Montreal; 790 steel frame box cars from Canadian Car & Foundry Co., Port William, Ont.; 250 steel frame box cars from National Steel Car Corp., Port William, Ont.; and 218 steel frame box cars from Eastern Car Co.

The Canadian Car & Foundry Co., between Mar. 14 and Apr. 12, delivered the following rolling stock: From Montreal, 13 sleeping cars and 18 baggage cars, 840 automobile cars and 714 automobile cars.

The following, evidently officially inspired, press dispatch was sent from Ottawa April 5:—“If Canadian railways have not been able to handle all Canada's freight requirements in 1918, 1919, and 1920, it is not the fault of the Dominion Government. Orders were given by the Government for delivery to the Canadian National Ry. in 1918 and 1919, and to the Canadian National-Grand Trunk Ry. in 1920, of 382 locomotives, costing \$21,228,247; 21,463 freight cars, costing \$66,710,094, and 331 passenger cars, costing \$11,314,469; or \$98,252,811 in all. All Canadian car

Rolling Stock Ordered for Government

Railways, Etc.

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Particulars of these orders were, of course, given from time to time in Canadian Railway and Marine World, but it was not stated that the orders had been placed by the Government. The Minister of Railways is constantly reiterating that the management of the Canadian National Ry., etc., and that the directors have a free hand. If that is the case, why should it be stated that the Government places the rolling stock orders? Does the Minister want to take the credit for popular things and to place the responsibility for others on the directors?

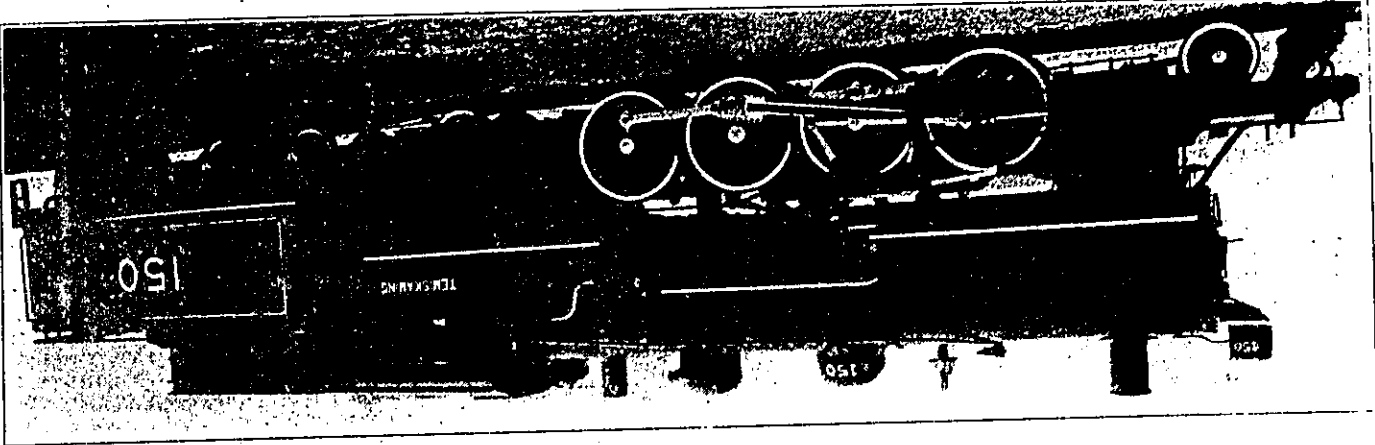
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Mikado (2-8-2) Locomotive, with Booster, Timiskaming & Northern Ontario Railway.

Driving wheel centers 53 in.
Driving wheels, diam. 3,224 sq. ft.
Heating surface, tubes 3,016 sq. ft.
Heating surface, firebox 208 sq. ft.
Weight of engine, rigid 16 ft. 8 in.
Wheel base of engine, total 31 ft. 8 in.
Weight of engine, total 258,000 lb.
Weight on drivers 197,000 lb.

Given on this page. The chief particulars of the completed locomotive is given on this page. The chief particulars of the completed locomotive is given on this page.

“For delivery in 1918 the Government ordered for the Canadian National Ry. 185 locomotives, of all types, 21 passenger cars, and 8,715 freight cars, at a total cost of \$36,217,998. For delivery in 1919 to the Canadian National, the Government ordered 50 locomotives, 3,037 freight cars and 260 passenger cars, at a total cost of \$18,718,820, and for delivery to the same road in 1920, 75 locomotives, 4,776 freight cars and 50 passenger cars, at a total cost of \$22,058,272.

“The Government ordered for delivery in the same year to the Grand Trunk Pacific Ry. 37 locomotives and 860 freight cars, valued at \$5,243,925, and to the Grand Trunk Ry. 35 locomotives and 4,075 freight cars, at a total cost of \$16,113,795.

“The locomotives cost from \$37,000 to \$40,500 each, for switching locomotives, \$72,500 for the Santa Fe type obtained from Montreal Locomotive Works. Freight cars cost from \$2,370 for flat cars, to \$48,500 for a steel rotary snow plough, also obtained from the Montreal company. The passenger cars ranged from \$24,000 for colonist cars to \$49,348 for sleepers.”

Particulars of these orders were, of course, given from time to time in Canadian Railway and Marine World, but it was not stated that the orders had been placed by the Government. The Minister of Railways is constantly reiterating that the management of the Canadian National Ry., etc., and that the directors have a free hand. If that is the case, why should it be stated that the Government places the rolling stock orders? Does the Minister want to take the credit for popular things and to place the responsibility for others on the directors?

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Railway Rolling Stock Orders and Deliveries.

A black and white photograph of a steam locomotive pulling a passenger car. The locomotive is on the left, and the passenger car is on the right. The passenger car has the number '8' visible on its side.

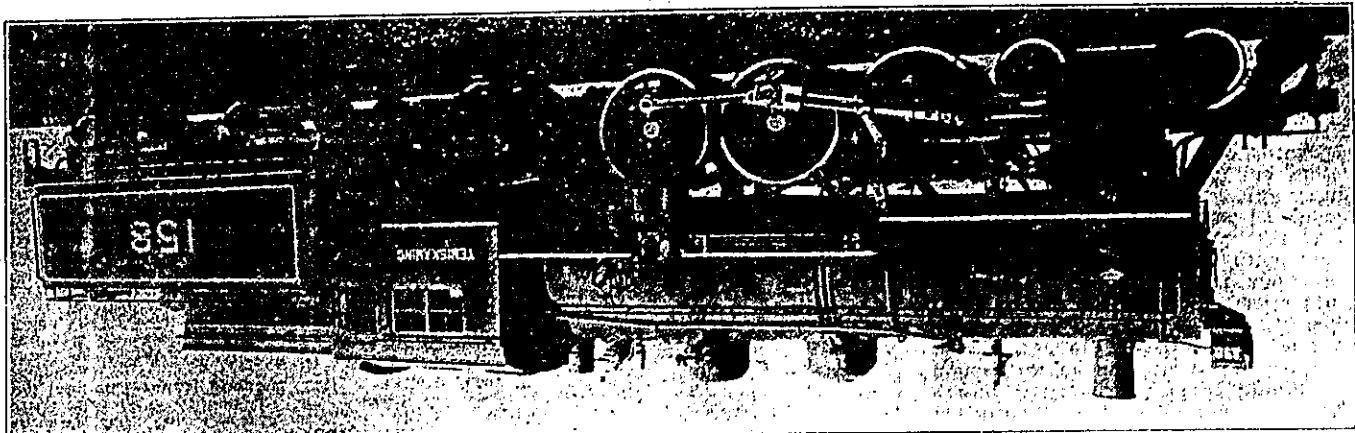
Weight, total	282,000 lb.
Wheel base of engine, rigid	12 ft. 2 in.
Wheel base of engine, total	32 ft. 6 in.
Wheel base of engine and tender	60 ft. 3½ in.
Heating surface, firebox and arch tubes	2,217 sq. ft.
Heating surface, tubes and flues	2,716 sq. ft.
Heating surface, total	2,933 sq. ft.
Wheel base, engine	30 ft. 7 in.
Wheel base, engine and tender	56 ft. 10½ in.
Weight, engine	173,000 lb.
Weight, tender	110,000 lb.
Weight on drivers	119,000 lb.
Weight on leading truck	29,500 lb.
Weight on trailing truck	24,500 lb.
Boiler, type	Helpaire, straight top

chief details are as follows:—

valves, outside valve gear, etc. The

for the year ending Oct. 31, 1922, passed by the Ontario Legislature recently, as mentioned in Canadian Railway and Marine World for May, is for two additional Mikado locomotives for the Timiskaming & Northern Ontario Ry. We were advised recently that it had not then been actually decided to order these. The C.P.R., between Apr. 14 and May 11, received 10 steel sleeping cars, the

Pacific locomotive, with booster, Timiskaming & Northern Ontario Railway.

[illegible]

Locomotive Booster Tests on Timiskaming & Northern Ontario Railway.

July, 1921.

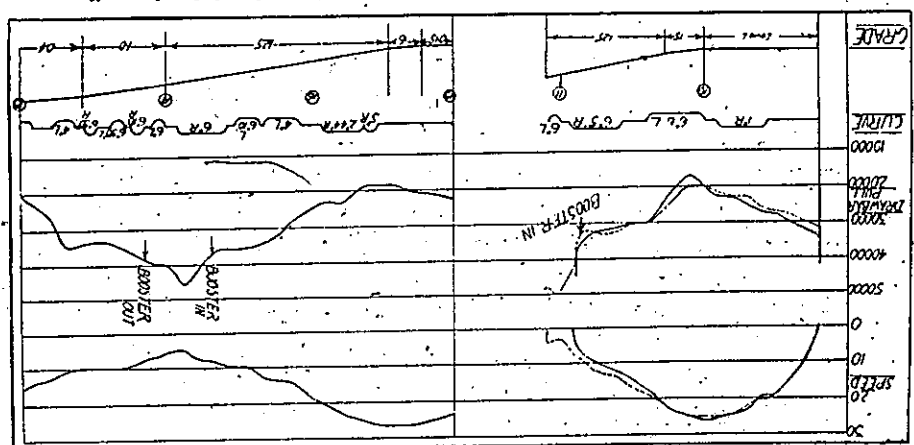
Locomotive booster tests on the T. & N.O. Ry. were described in a general way in Canadian Railway and Marine World for June. Since then, the results of the tests have been checked over and charts prepared, and the most important tests can now be dealt with more fully and the results shown graphically. A complete illustrated description of the booster's mechanical features was published in Canadian Railway and Marine World for June. The first test was made on May 9, with mikado locomotive 150, which was given a train out of North Bay consisting of 21 loaded freight cars, the dynamometer car, T. & N.O.R. official cars Temagami and the latest specialties and refinements applied to locomotives.

The tests were conducted with Canadian National Ry's dynamometer car 84, and locomotive 150, which was given a train out of North Bay consisting of 21 loaded freight cars, the dynamometer car, T. & N.O.R. official cars Temagami and the latest specialties and refinements applied to locomotives.

The train then proceeded to the grade between miles 16 and 18, the result of the booster being cut in on the 1.25% grade. The speed of the train, when the booster was cut in on the hard pull 1 (right). The speed of the grade being shown in fig. 1 (right). The speed of the train, when the booster was cut in on the hard pull 1 (right). The speed of the grade being shown in fig. 1 (right).

On May 10, the same locomotive was started from Englehart south with a train of 32 loaded cars, 4 empties, the dynamometer car, T. & N.O. Ry. official car Temagami, and caboose. The actual tonnage was 1,800, contents 957, tare 843, and the adjusted tonnage, T. & N.O. R. rating, 1,995. Fig. 2 shows the re-

The tonnage for this grade, with this at mile 11 without the booster cut in. do with this train on the 1.25% grade to see first what the locomotive could north from North Bay. It was decided the performance of the locomotive with ing 1,501. Fig. 1, given herewith, shows age with the T. & N.O.R. allowance be- contents and 645 tare, the adjusted ton- age of this train was 1,401 tons, 756 Whitney, and a caboose. The actual ton-

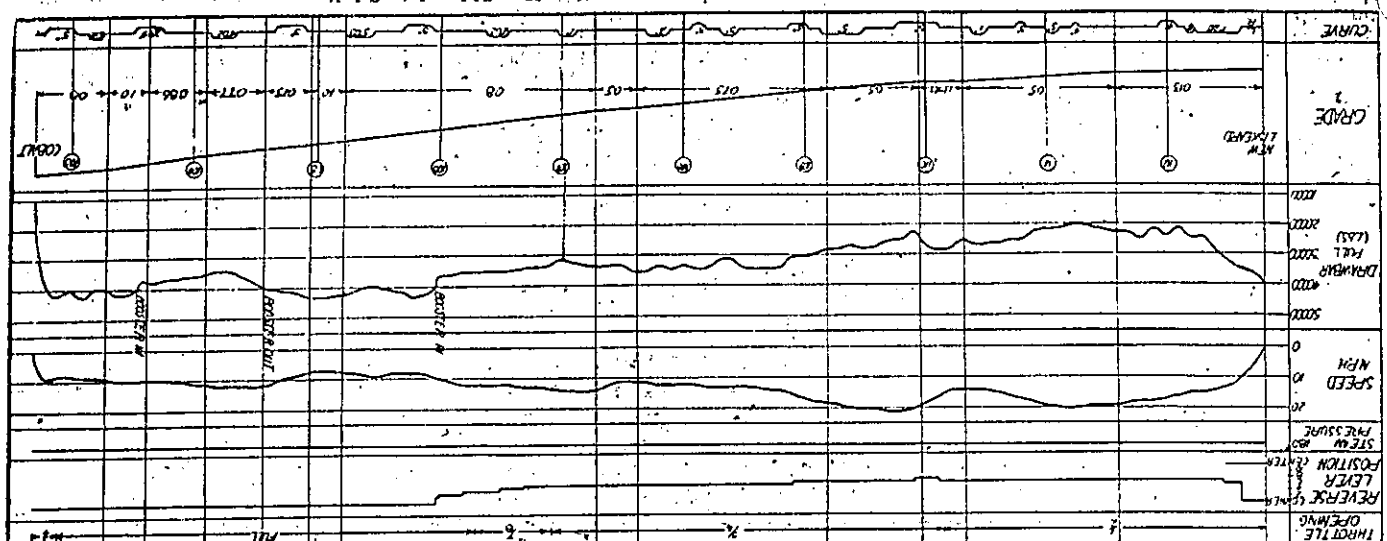


Left side, from mile 9.2 to mile 11.1, on 1.25% grade. Dotted line, with booster cut in; full line, without booster cut in. Right side, between miles 16 and 18, showing effect of cutting in booster.

World for Dec. 1920, pg. 661. As stated previously, boosters have been applied on one mikado and four Pacific type locomotives on the T. & N.O. Ry. The mikado to which the booster is applied was described and illustrated in Canadian Railway and Marine World for May, pg. 252. This locomotive has a tractive power of 45,500 lb. without booster, weight on drivers 197,000 lb., cylinders 25 x 30 in., and is thoroughly modern in design. Details and an illustration of

Fig. 2. Booster Test, with Mikado Locomotive 150, from New Liskeard to Cobalt. Showing conditions of throttle opening, reverse lever position, steam pressure, speed, drawbar pull, grade and curve at all times.

the Pacific type locomotives equipped with the booster were given in Canadian Railway and Marine World for June, pg. 309. The tractive power of these Pacific is 36,600 lb. without booster weight on drivers 155,000 lb., cylinders 28 x 28 in. They are thoroughly modern in all details of design and construction, and are notable as embodying practically all



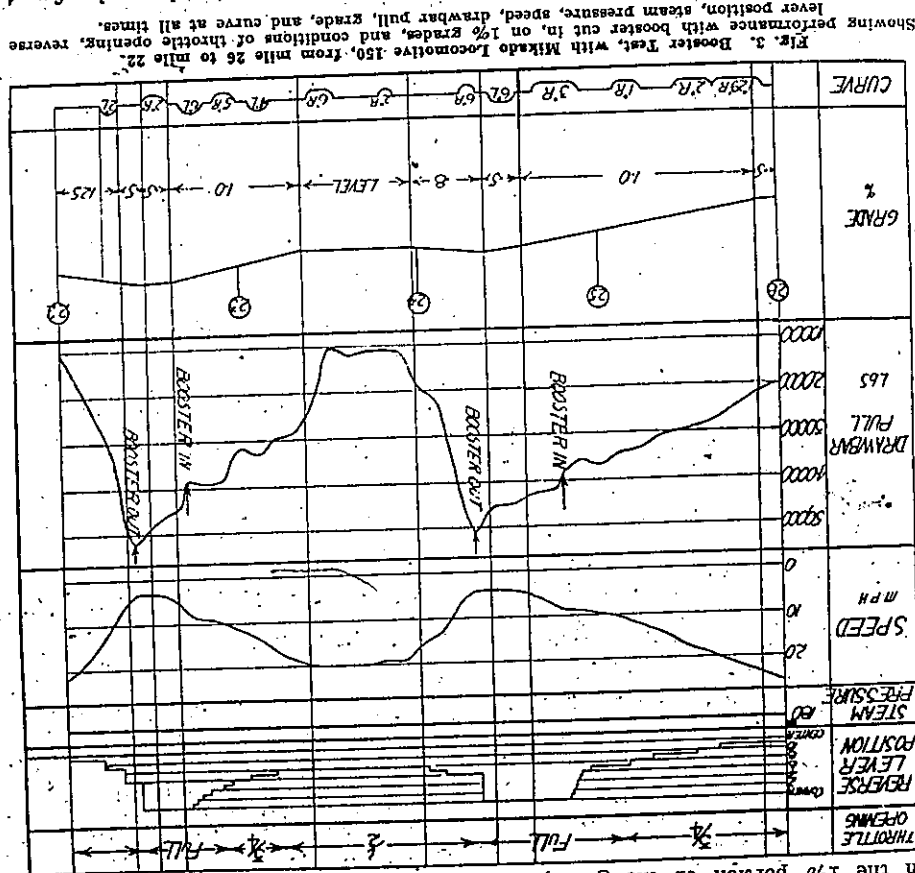
July, 1921.

miles an hour and the drawbar pull was increased to 43,000 lb. and speed was maintained at about an average of 8 miles an hour on the 0.8%, 1% and 0.75% portions of the grade until the booster was cut out 0.42 mile south of the drawbar pull. When the booster was cut out, the drawbar pull dropped from 40,000 lb. to an average of 36,000; when the booster was again cut in, 0.42 mile south of mile 104, on the 1% portion of the grade, the

As the train topped the summit, the drawbar pull being 38,000 lb. 2 minutes, the drawbar pull exerted was 28,000 lb. at a speed of 12 miles an hour, and in 170 seconds, or less than 3 minutes, a speed of 15½ miles an hour had been attained, the drawbar pull, being motive handled the train on this lift, which took place over frogs and switches, on a 1% grade, and uncompensated 10 degree curve, and the rapid acceleration shown under these conditions, were highly gratifying, and demonstrated the ability of the booster in getting trains to road speed quickly, in leaving terminals, or after station stops.

Fig. 4 (right) shows the result of a test designed to determine the acceleration obtainable on level track. The same train, of 942.7 tons, was handled north out of Tomiko, mile 27.3 from North Bay, the drawbar pull when lifting the train registering as 38,000 lb. This remained practically constant for 10 seconds, as a speed of 3½ miles an hour was being attained; in 30 seconds it registered as 29,000 lb.; the speed being 8½ miles an hour. At the end of one minute, the drawbar pull showed as 23,000 lb., and speed had increased to 16½ miles an hour. The tests with mikado locomotive 150 amply demonstrated the correctness of the proposition that a largely increased tonnage can be handled over a division without difficulty. It can be successfully got over the few hard pulls of the division, and they demonstrated the ability of the booster in aiding the locomotive to get it over the hard pulls. The T. & N.O.R. has a profile marked by several short, steep grades, which have acted to limit the tonnage handled in the past. By enabling a locomotive to take a tonnage increased by 20%, over these grades, the value of the booster applied to the freight hauling units of such a railway is at once evident. In addition, many of the stations and water stops are on grades, so that time saved over the division by the high acceleration of passenger trains obtained by the use of the booster in leaving stations, have expressed complete satisfaction with the performance of the device and the efficiency shown by it in doing the work for which it was designed.

is indebted to S. B. Clement, Chief Engineer Canadian Railway and Marine World



ing, is 36,600 lb. As shown by fig. 4 passenger train 1 from North Bay to Canadian National Rys. transcontinental motive was tried on May 11, and handled N.O.R. North Bay terminal. This locomotive was 942.7 tons, northbound out of the T. &

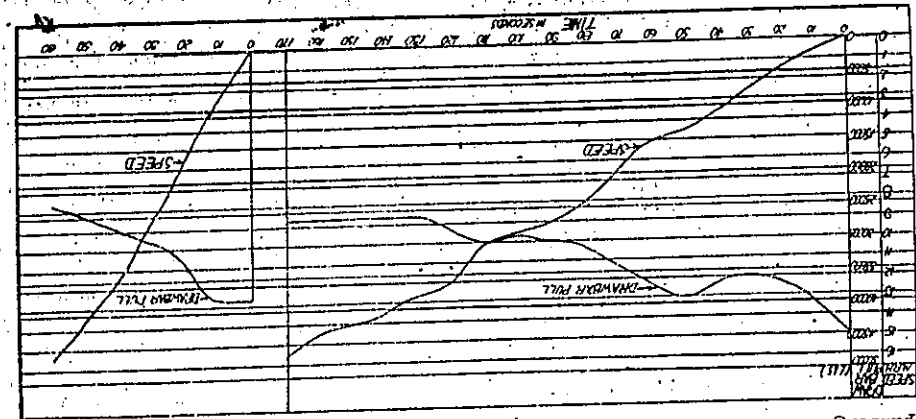
drawbar pull increased from 37,000 to 43,000 lb., speed remaining constant for 0.6 mile at 10 miles an hour, but dropping to 9 miles an hour on the 6 degree 12 minute curve, while drawbar pull increased to 43,000 lb. at this speed. The train was thus handled into Cobalt with-out difficulty, by making the booster operative twice for short intervals on the line representing steam pressure in fig. 2 is straight. The reason for this is that mikado locomotive 150, in common with the others of its class used by the T. & N.O.R., and Pacific type locomotive 157, proved to be an exceptionally free steamer, so that no deviation of any importance from the 180 lb. boiler pressure was experienced.

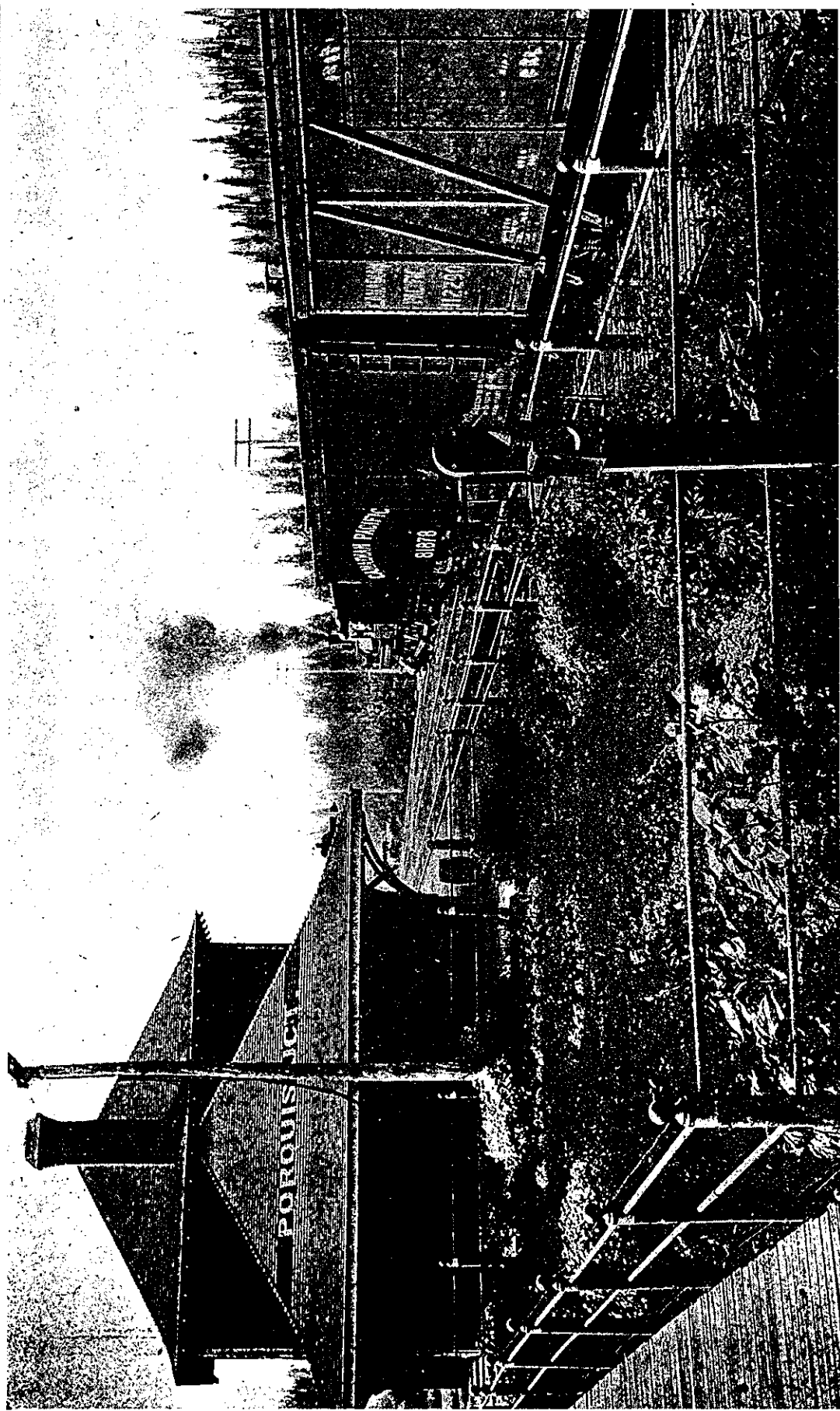
Southbound, out of Cobalt, another

load was switched into the train, making the actual tonnage 1,848, and adjusted tonnage 2,048 tons. Fig. 3 shows the results with this train, between miles 26 and 22. The booster was cut in 0.22 mile south of mile 25, on the 1% grade, when the speed was 9 miles an hour and drawbar pull 39,000 lb. As the speed gradually came down to 4 miles an hour, while the train approached the summit, the drawbar pull gradually increased until it reached a maximum of 51,000 lb. The booster was cut in, on lifting the train, was 46,000 lb. In 60 seconds, the drawbar pull was 37,000 lb., and a speed of 5 miles an hour had been attained; in

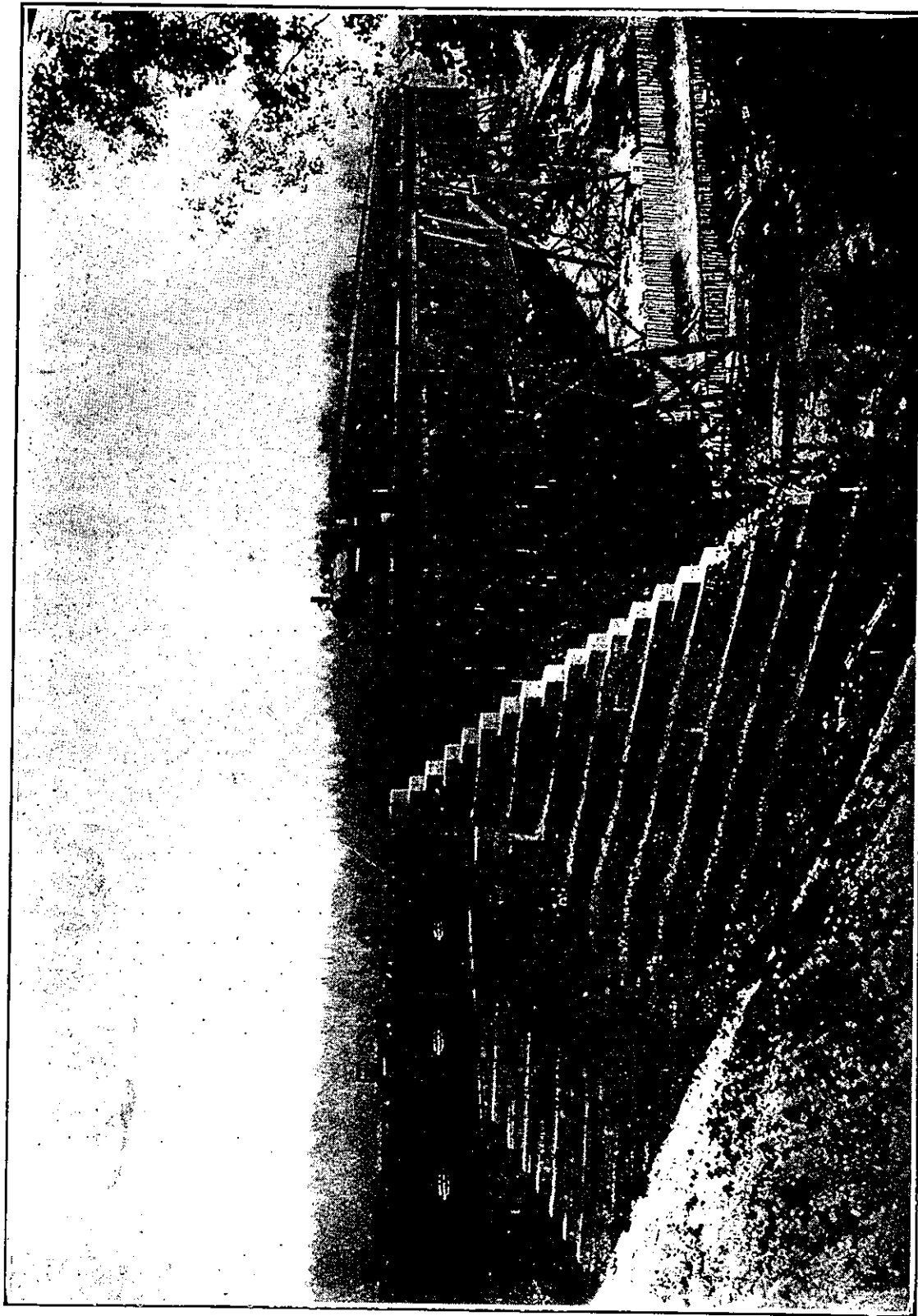
the speed had decreased to 7 miles an hour, the drawbar pull was not until of mile 23, on a 1% grade, but not until the booster was cut in again 0.32 mile south of mile 23, on the 1% grade, when the speed was 9 miles an hour and drawbar pull 39,000 lb. As the speed gradually came down to 4 miles an hour, while the train approached the summit, the drawbar pull gradually increased until it reached a maximum of 51,000 lb. The booster was cut in, on lifting the train, was 46,000 lb. In 60 seconds, the drawbar pull was 37,000 lb., and a speed of 5 miles an hour had been attained; in

Fig. 4. Booster Test, with Pacific Locomotive 157. Left side, lift of passenger train of 942 tons out of North Bay yard, over frogs and switches, on 1% grade, and 10 degree curve, uncompensated. Right side, acceleration, with aid of booster, in starting train out of Tomiko station on level track. neer, Timiskaming & Northern Ontario Ry., for the charts reproduced in the accompanying illustrations, which were prepared by Frank Williams, Mechanical Designer, Canadian Government Railways, Moncton, N.B.





T. & N. O. Railway Station at Porquis Junction.



Cobalt Special Crossing Bridge at Englehart.



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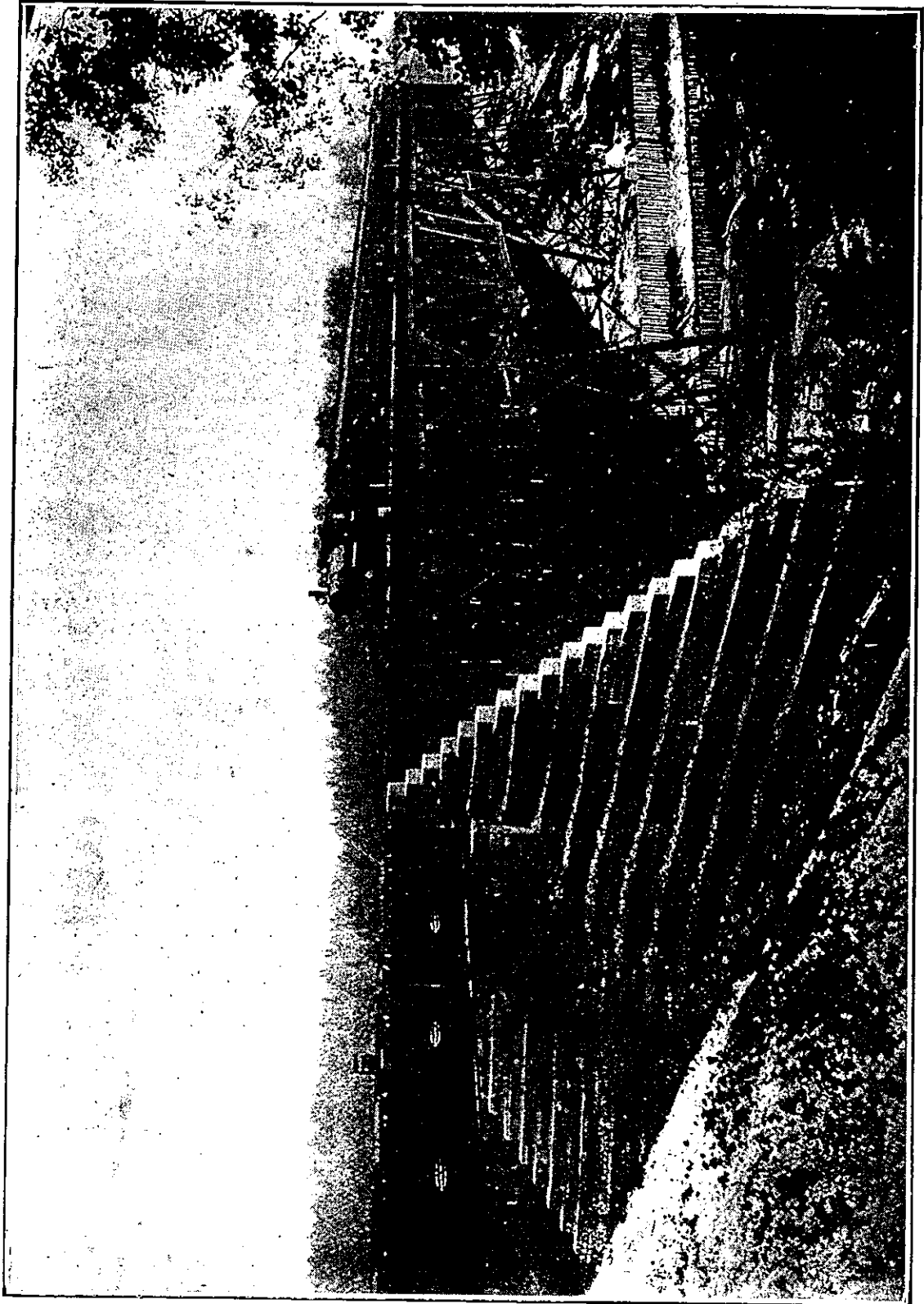
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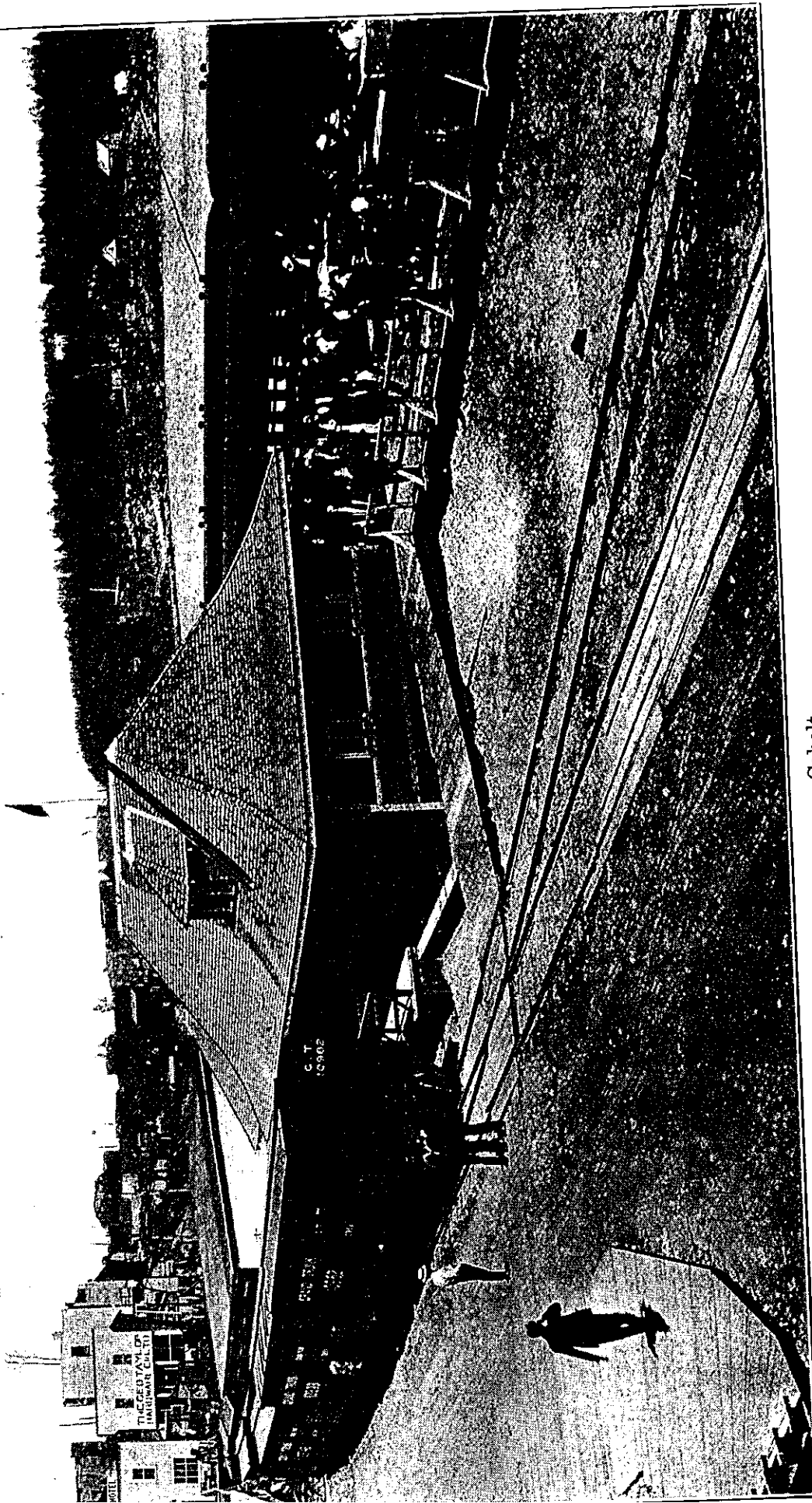
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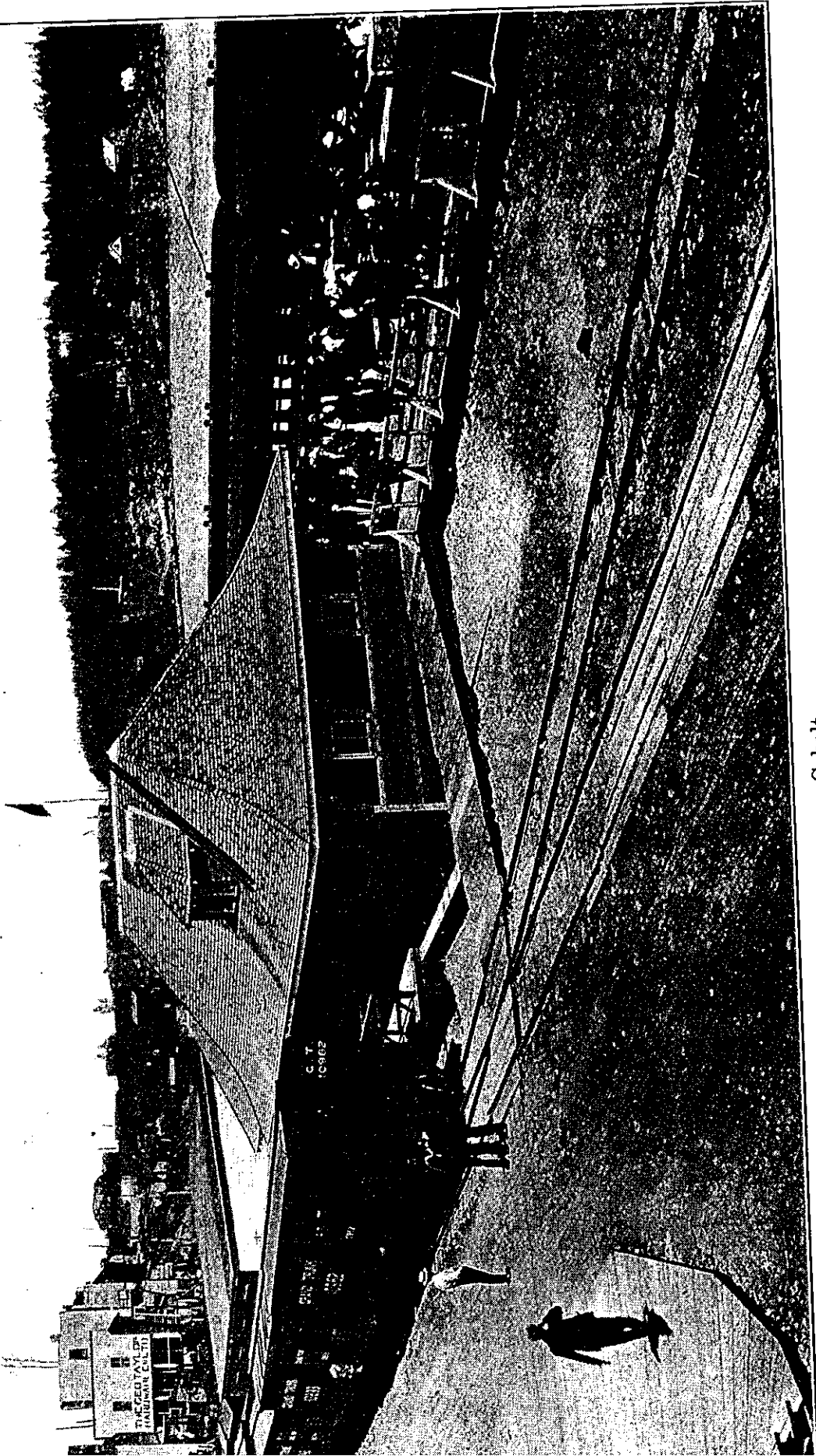
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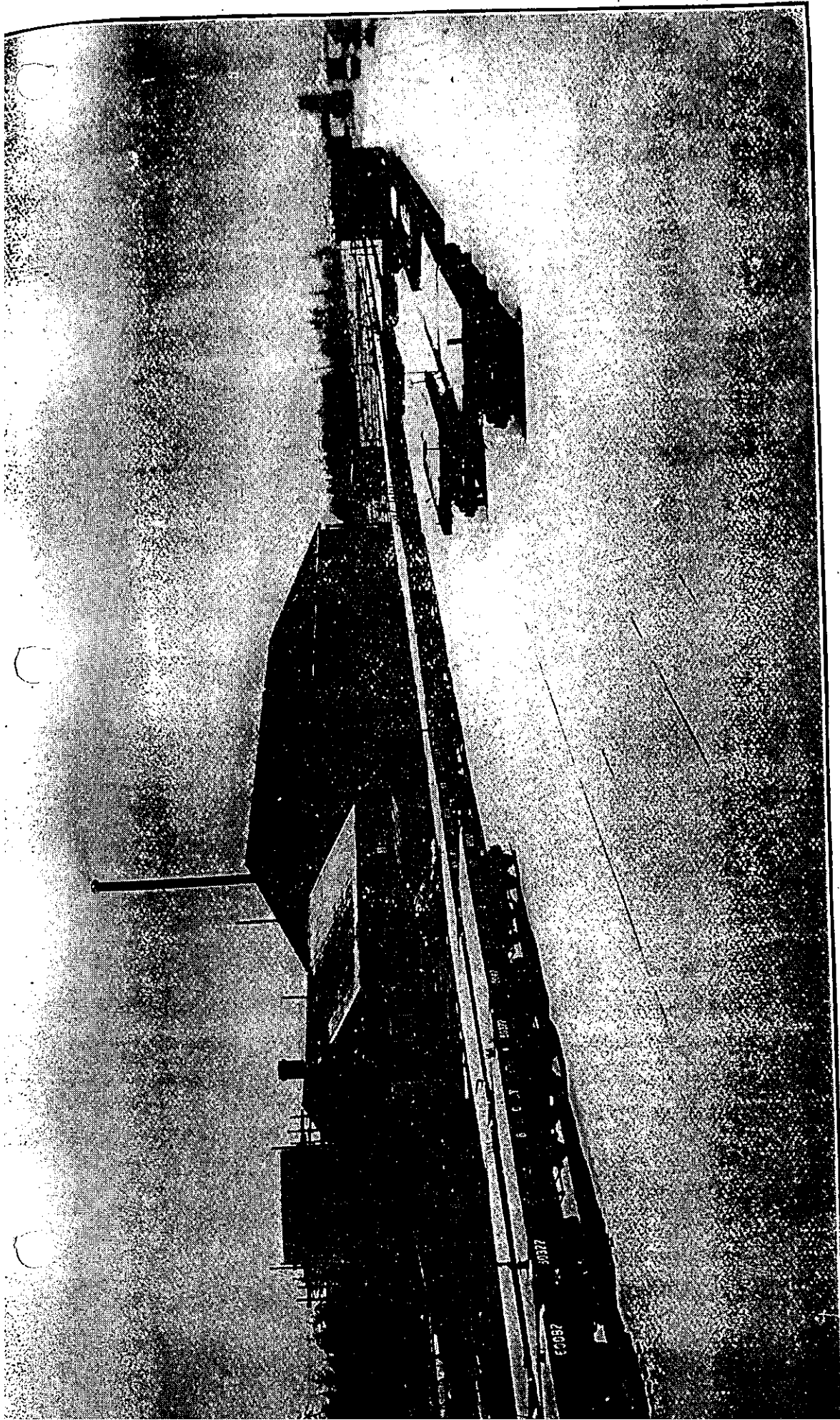
Cobalt Special Crossing Bridge at Englehart.



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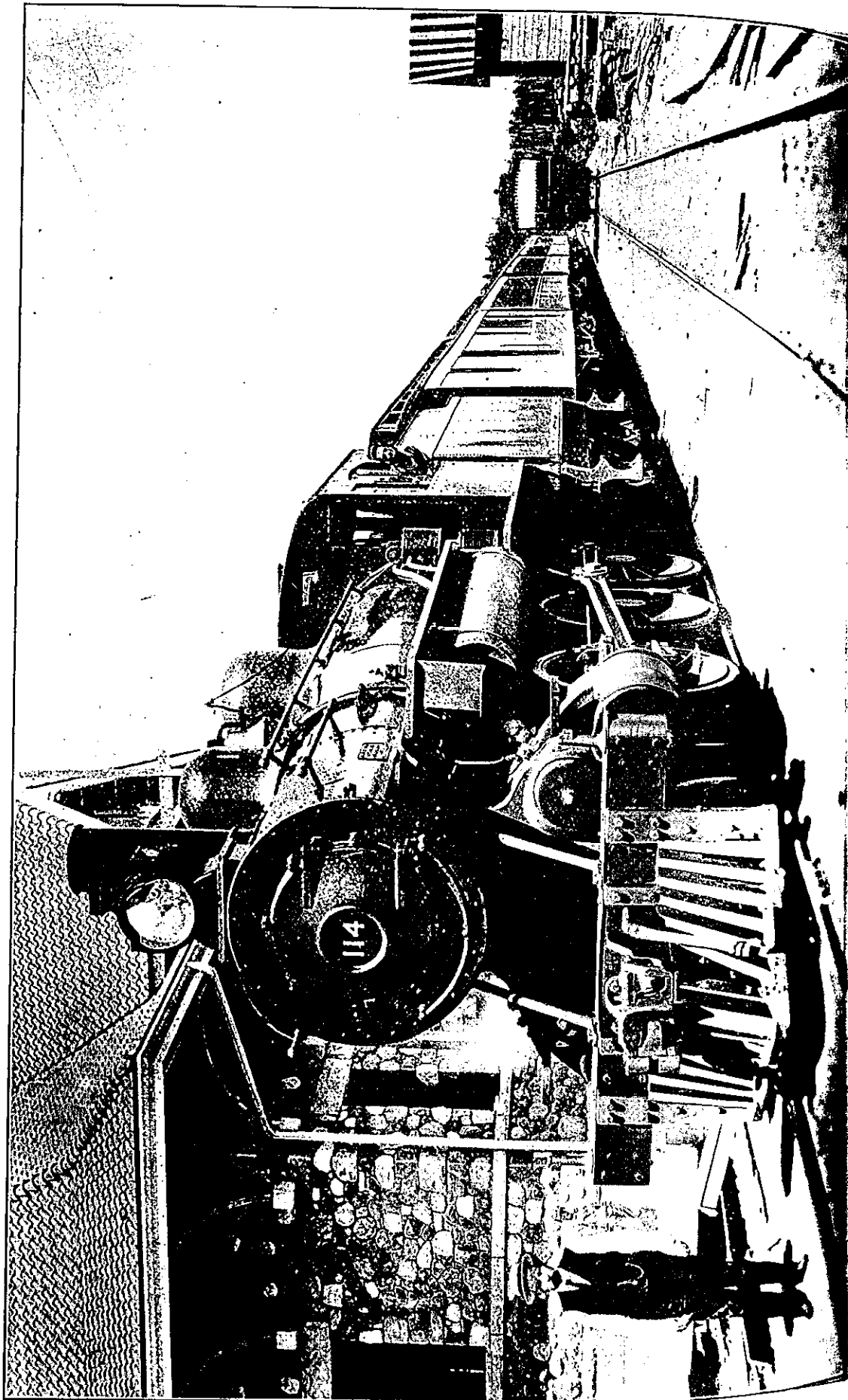


Cobalt.



Machine Shop at North Bay.

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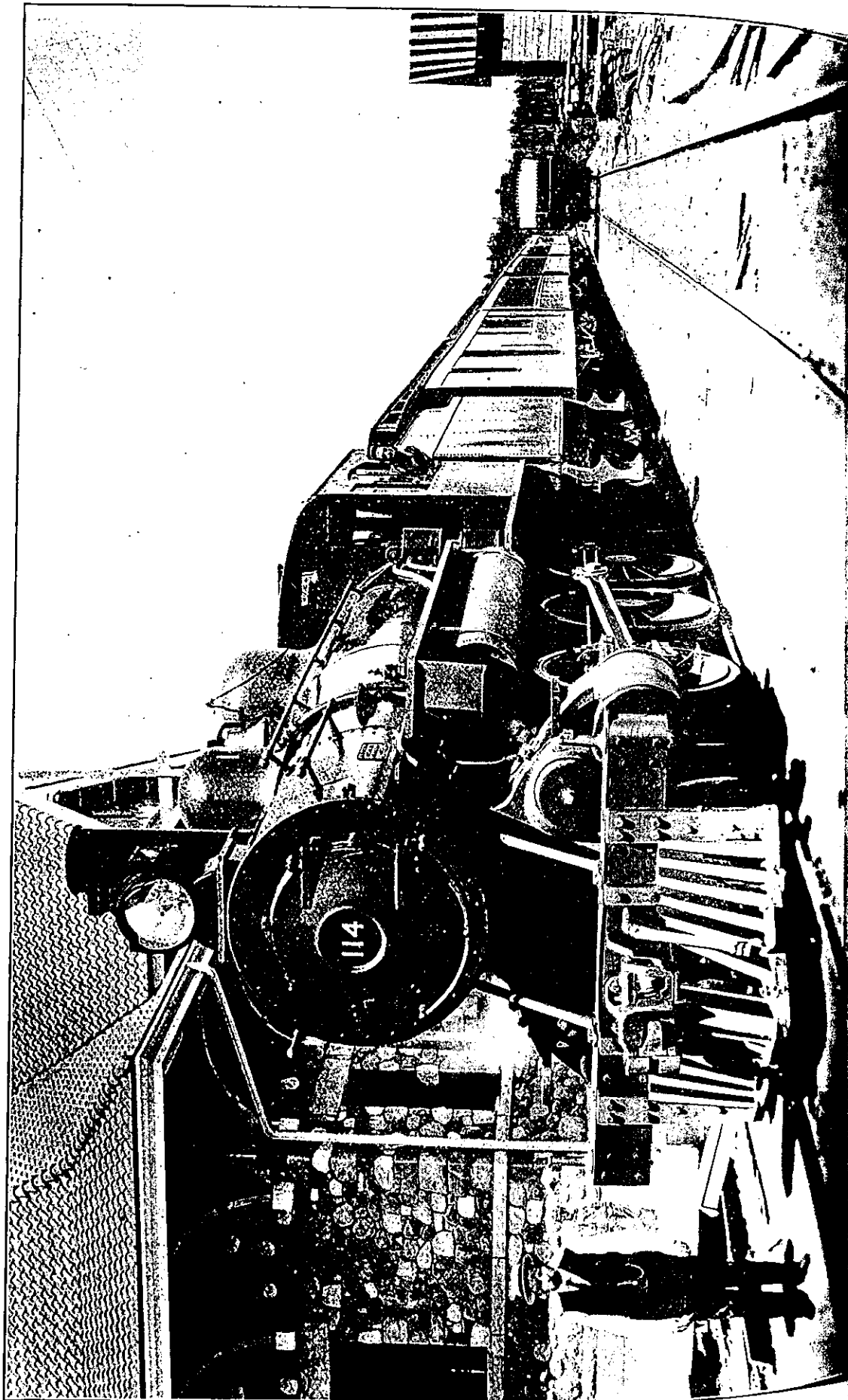
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