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The Location and Construction of the Canadian Northern Pacific Railway in British Columbia.

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The route followed by the Pacific Section of the Canadian Northern Railway System in reaching tide water from the interior, is of remarkable interest, not only because it follows the best natural highway through the Pacific mountain system of North America, but because there appears to be no other instance where a great mountain region is traversed by a railway with such easy gradients and with such comparative economy of construction. To understand this situation it is necessary to consider briefly the main physical features of British Columbia.

TOPOGRAPHY.—In broad outline the Canadian Cordillera may be divided into four provinces: (1) The Rocky Mountain system; (2) The Middle or Interior Range, including the Purcell, Selkirk, Columbia, Cariboo and Cassiar Mountains; (3) The belt of interior plateaus; (4) The Coastal System, including the Coast, the Cascade, and the Vancouver-Queen Charlotte Ranges. The first, third and fourth of these provinces extend, with but minor interruptions, through Yukon Territory and Alaska to the Behring Sea. The middle ranges are specially broad in southern British Columbia, but practically disappear about latitude 54 degrees, and reappear again between latitudes 56 and 62 as the Cassiar Range. Thus, briefly, we have two main mountain systems, one composed of the Rocky Mountain and Middle Range systems, the other the Coast Range, and between the two lies the belt of the interior plateaus. The striking feature of the first group of mountains which form the first and principal obstacles met with in approaching tide water from the prairies, is that they are subdivided by a number of great depressions running approximately northwest, and making a small angle with the main axis of the mountain ranges. The greatest of these depressions extends from Flathead Lake, in Montana, to the Yukon boundary, 990 miles. It is a relatively narrow but imposing trough, successively drained by the headwaters of most of the great rivers of the Canadian Cordillera. The larger streams flowing in the depression are:—The Kootenay, the Columbia, the Canoe, the Fraser, the Parsnip and Finlay (of the Peace River system), and the Kachika (of the Liard River system). Many of these leave the trough by transverse gorges cut in the adjacent mountains. All the mountains in Canada and in Montana lying to the northeastward of the trench have long been segregated as the Rocky Mountain system, and the trough has been named the Rocky Mountain trench. A second trench, about 220 miles long, cleaves the southeastern wall of the first, near Beavermouth, and runs southward. It is successively drained by the Beaver, Duncan and Kootenay Rivers, and for 74 miles is occupied by the Kootenay Lake. This trough rigorously separates the Purcell Mountain Range on the east, from the Selkirk Range on the west, and is called the Purcell trench. The Purcell Range is thus bounded on the east and west by the two

trenches, and on the south by the loop of the Kootenay River in Montana and Idaho. A third depression extends from near latitude 52 degrees, where the Columbia River leaves the Rocky Mountain trench and flows south in a wide valley 310 miles long to the Columbia lava fields of Washington State, passing through the Arrow Lakes on its way. This depression is sometimes referred to as the Selkirk Valley. East of the Selkirk Valley, and west of the two master trenches, is the Selkirk Mountain system, which, like the Rocky Mountain and Purcell systems, extends into the United States. The rugged mountains to the west of the Selkirk Valley have been grouped under the name of the Columbia Mountain system. Between the 54th and 56th parallels the western wall of the main Rocky Mountain trench is much less prominent than it is either to the south or the north, where it is formed by the Cassiar Mountain Range, so much so that between these two parallels the interior plateaus might be said to extend right up to the trench. The various ranges to the west of the Rocky Mountain trench and south of the 52nd parallel concentrate into one north of the Selkirk Valley. The single range has its narrowest width and lowest pass at Albrede Lake, almost opposite the Yellowhead Pass.

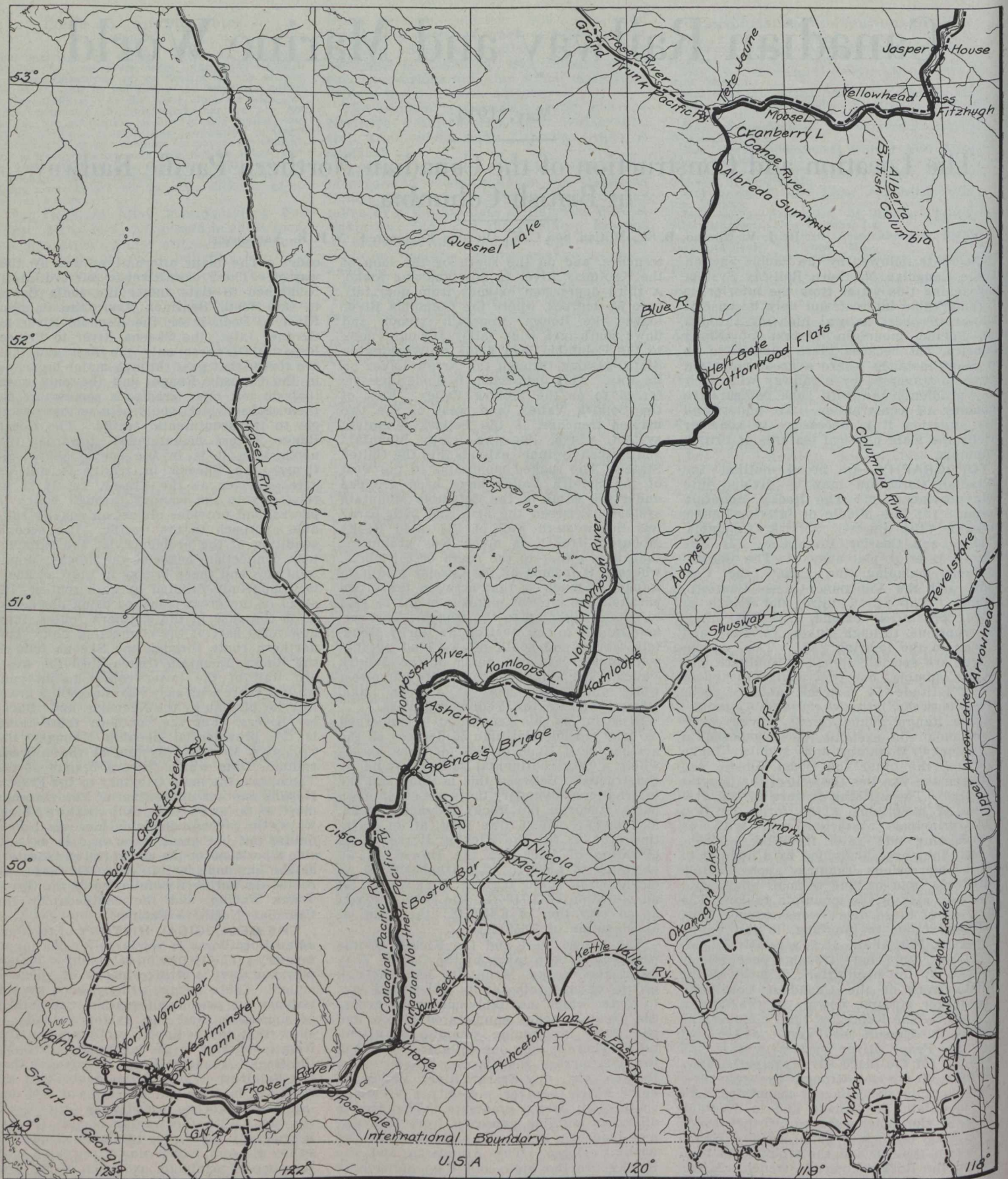
In so far as this generation is concerned we may consider latitude 56 degrees as the northernmost limit of the territory across which a transcontinental railway would be constructed. Between this latitude and the International Boundary there are seven main passes through the Rocky Mountain chain, as follows:—The Crows Nest, at an elevation of 4,449 ft.; the Kicking Horse, at an elevation of 5,200 ft.; the Howse, at an elevation of 4,500 ft.; the Athabasca, at an elevation of 5,710 ft.; the Yellowhead, at an elevation of 3,718 ft.; the Smoky River, at an elevation of 5,400 ft.; the Pine, at an elevation of 2,850 ft.

The Crows Nest and the Kicking Horse passes have been taken by the C.P.R. They cross the Rocky Mountain and Selkirk groups of mountains at its widest and lead to routes which inevitably cut square across the great trenches enumerated above, and pass over intervening summits of magnitude. There is only one suitable route open to them across the Cascade and Coast Ranges, viz., the Fraser River Valley, to enter which involves, not only a circuitous route, but heavy gradients. The Howse offers no suitable approach from the east, and leads to the same difficulties as the Kicking Horse. The Athabasca and the Smoky are too high, and the approach to them from the west and the east is too rapid for easy grades. The Pine is good, but the geographical situation places it at a disadvantage as compared with the Yellowhead, which alone complies with the necessary requirements of:—Easy approach from the west and the east, access to an easy pass through the Cascades, and to a first class deep water harbor.

This leads to the consideration of the approach to the Pacific through the Cas-

cadés. The main alternatives are by the way of:—The Fraser River to Burrard Inlet; Nomathco to Bute Inlet; the Bella Coola to the North Bentinck Arm; the Salmon River to Dean Inlet; the Kemano River to Gardner Inlet; the Skeena River to Prince Rupert. Of these only the first and last are routes that pass through major breaches in the Cascade Range, and the only ones that do not offer gradients somewhere in their course which would be a serious obstacle to transcontinental traffic. The Coast Range is less mountainous towards the north than it is in the south, hence, although the Skeena in reality is not as great a river as the Fraser, yet it is so relatively to the country through which it passes, and provides almost an equally suitable approach to the Pacific. The second condition of the problem, viz., the satisfactory connection between the Rocky Mountain pass and these breaks in the Cascades, is wonderfully fulfilled by both routes. In stead of the great trenches being obstacles, as is the case in the southern routes, they now form part of the connecting link. The northern route through the Skeena follows the Rocky Mountain trench until the western wall of the latter comes to an end, whence there is an easy way across the great interior plateau by the Nechako and Buckley Rivers. For the southern route there is the providential opening through the Columbia Mountain system at the Albrede summit, from which flows a branch of the Thompson, the main tributary to the Fraser. Here is another illustration of how railways must, as far as possible, follow nature's highways, the rivers. Seldom, however, does nature put her great waterways in as suitable a position for the use of railway locators as she has done in this case. Of these two routes the northern is followed by the Grand Trunk Pacific, and the southern by the Canadian Northern Pacific.

THE GEOLOGICAL HISTORY of the Canadian Cordilleras is yet largely a matter of mystery. The formation is chiefly sedimentary, and there is little evidence of volcanic action. There appear to have been several sedimentary periods alternating with periods of upheaval; and the evidence tends to show that the sediment was from detritus from mountains to the northeast. Probably the Rocky Mountain Range is younger than the Selkirks. There is no doubt that the region of interior plateaus was covered during the Pleistocene period by the cordilleran ice cap. With the waning of this ice cap it gradually gave place to alpine, cirque and valley glaciers, which slowly retreated until the time of maximum extension of the Keewatin ice sheet on the east, when the second period of valley glaciation took place. These glacial conditions, followed by eons of disintegration and slow (and probably discontinuous) land upheaval, appear to have modified the original form of the Cordilleras to their present condition. By what exact process the wonderful rift was made, which is followed by the C.N.P.R. through these mountains, can only be determined, if ever, by very much more geological study



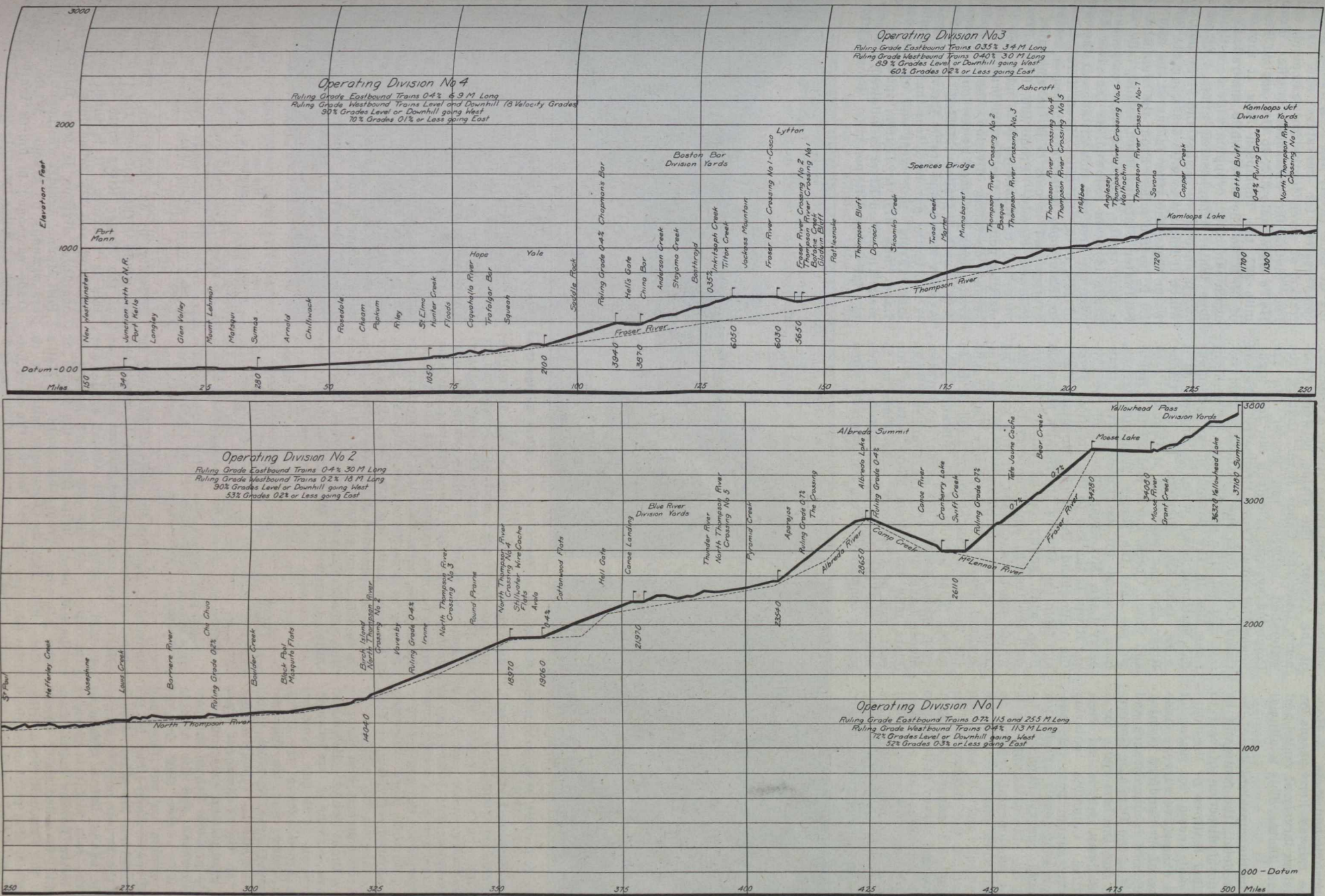
Canadian Northern Pacific		Grand Trunk Pacific & Pacific Great Eastern	
Canadian Pacific & Kettle Valley		Great Northern & Vancouver, Victoria & Eastern	

Route of the Canadian Northern Pacific Railway in British Columbia.

than has been given up to the present; but whatever the cause, the result is unique and stupendous. The route followed by the C.N.P.R. may be taken for geological purposes in the following divisions—1, From

Jasper House to Blue River. This section traverses the Rocky and Selkirk Mountains, and for part of the distance lies in the Rocky Mountain trench; 2, from Blue River to Ashcroft. This section is through the

belt of the interior plateaus; 3, from Ashcroft to Rosedale. Traversing the Coast Range; 4, the Fraser Delta from Rosedale to Vancouver. The formation through the first of these sections consists of sandstone,



Profile Showing Grades of Main Line Canadian Northern Pacific Railway, New Westminster Bridge to Yellowhead Pass.

limestone, argillaceous and siliceous shales etc., but the predominating features are quartzites, mica, schist, some granite and gneiss, a great deal of gravel and boulders and some glacial clay. The rock in the second section is composed largely of shales, conglomerate sandstone, limestone, quartz-

Spences Bridge to Boston Bar. The most striking feature of this territory is the predominating occurrence of gravel and boulders. The slope of the valley for miles consists of unknown depths of this material, sometimes running up the mountain side

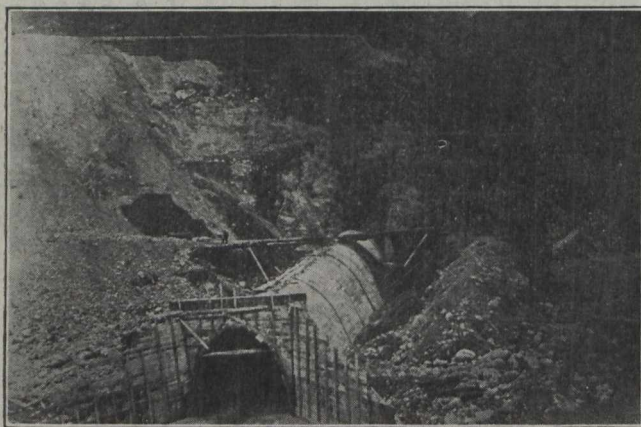
for several thousand feet. The rock, of which a good deal is encountered, consists chiefly of shale, sandstone and limestone. 2, Boston Bar to Hope. This comprises the Fraser Canyon proper, and is almost entirely in rock, which consists of grano-dyar-

ite, sandstone, limestone and shale. 3, Hope to Rosedale. The railway here passes on the benches consisting largely of gravel and sand. 4, The Fraser Delta. This is alluvial formation.

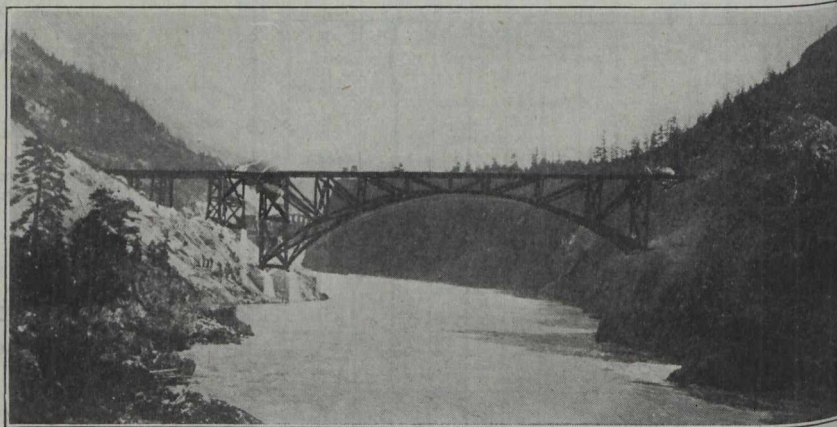
LOCATION.—For the consideration of the location in greater detail, the route will be followed in a general direction of east to west. The principal features of the route have long been well known, by reason of the very able and exhaustive surveys made under the direction of Sir Sandford Fleming from 1872 to 1880, both reconnaissance and in detail, on behalf of the Dominion Government, in order to find the best route for a transcontinental railway, which had been promised on British Columbia entering Confederation. One cannot pass this subject without expressing one's admiration for the ability and energy displayed by Sir Sandford and his able assistants, as is evidenced by the monumental reports on their work, which were published by the Dominion Government, and to which the author owes much of the information in the early part of this paper. Amongst others, an instrumental survey of the route now followed by the Canadian Northern was made, and Sir Sandford recommended that route to the Government. Why this advice was disregarded, and the C.P.R., the outcome of the Confederation policy,

source of the McLennan River, a tributary of the Fraser. The divide between Cranberry Lake and Canoe River, that is, the watershed between the Fraser and the Columbia system, is only a few feet high; hence McLennan Creek, Cranberry Lake and Camp Creek form one continuous wide valley. To put it in another way:—Cranberry Lake lies in the bottom of an enormous flat bottomed bowl, which is broken, as it were, into four quarters, by the Canoe River east and west, and McLennan Creek and Camp Creek, north and south. Hence we see that the Rocky Mountain trench, here drained by the Canoe River, Cranberry Lake, McLennan Creek and the Fraser River, is the key to the situation. From the Yellowhead, the Rocky Mountain Pass and from the Albreda, the Selkirk Mountain Pass, wide, gently falling valleys connect with the trench; and Cranberry Lake Flat, which must be crossed, is the governing feature of the connection. From the Yellowhead summit to Cranberry Lake, mile 439, there is a fall of about 1,100 ft. in 60 miles. That portion of this distance, however, which governs the grade, lies between Moose Lake, mile 473, and Cranberry Lake Flats, mile 439. From Moose Lake to the east end of Cranberry Lake Flats is 25 miles and the total fall is 816 ft. This gives a continuous seven tenths grade, when

ing at Blue River, has long ruling grades compensated for curvature and passing tracks, of seven tenths for eastbound, and four tenths for westbound traffic. From Hell's Gate, mile 372, to Cottonwood Flats, mile 367, the Thompson falls at the rate of 37 ft. to the mile, while the railway is again supported, dropping with a continuous four tenths compensated grade. At mile 367 it once more strikes the river bottom, which it follows to mile 353 along the Stillwater Flats, the river falling at the rate of 1.4 ft. to the mile. From the west end of Stillwater Flats to Birch Island, mile 322, a four tenths supported and compensated grade is again followed, as the river falls over the first part this distance at the rate of 18½ ft. to the mile. From Birch Island to Kamloops, mile 243, the river, whose average fall is only 3 ft. to the mile, is followed closely. From the Blue River, mile 384, to Kamloops Jct., mile 243, the starting point of the Vernon branch, is the second operating division, the eastbound grade being governed by the long supported four tenths grade referred to before. Against west bound traffic the ruling grade is two tenths per cent., less than two miles long. From the west end of Kamloops Lake, mile 218, to Lytton, mile 145, the main Thompson River is followed, the average fall being 9 ft. per mile. From Lytton,



Tilton Creek Concrete Culvert, Mile 130.5, Before Fill Had Been Made.



Cisco Bridge Over Fraser River, Near Lytton, Mile 140.

was built over the Kicking Horse Pass will, no doubt, be disclosed some day. But however surprising such a choice may appear to the engineer, there can be no doubt that this selection has been of great benefit to the country as a whole, inasmuch as it has opened up the southern portion of British Columbia more efficiently and earlier than otherwise could have been done. Moreover, this choice left open to its younger, and consequently less vigorous rival, a route without which the latter could hardly have become a transcontinental railway as soon as it now promises to be; while the broad back of the C.P.R. is well able to carry, and its financial strength to surmount, the difficulties which the Kicking Horse route is responsible for.

The approach to the Yellowhead Pass from the east is gradual and easy; and the crux of the whole problem lies in the part between the Yellowhead and the Albreda summit, which is a water shed for the Columbia River system on one side, and the Thompson River system (that is, the Fraser River system) on the other. Hence the route leaves the Fraser only to eventually return to it again, but a glance at the map shows the gain that this gives in distance. The water flowing north from the Albreda summit is called Camp Creek, and empties into the Canoe River, a tributary of the Columbia, at a point only about four miles south of Cranberry Lake, the

due compensation is made for curvature and passing tracks, and was considered to be the economic grade for that country. Thus was fixed the ruling grade for east bound traffic for the operating division whose eastern extremity is at the Yellow head Lake, mile 495, and the western extremity at Blue River Flat, mile 384. From Cranberry Lake the line rises with a four tenths compensated grade to Albreda Lake, mile 425, at an elevation of 2,854 ft. Since the Albreda falls at the rate of 43 ft. to the mile, a supported grade going south was

mile 145, to Hope, mile 77, the Fraser River has an average fall of 5½ ft., and from Hope to Rosedale, mile 47, 3 ft. per mile. The third operating division is from Kamloops Jct. to Boston Bar, mile 119, over which distance there are short ruling grades against eastbound traffic, of four tenths compensated for curvature. Against westbound traffic there is a four tenths grade compensated for curvature, about three miles long, at the east end of Kamloops Lake. This grade, however, if traffic demands it, can be replaced without much

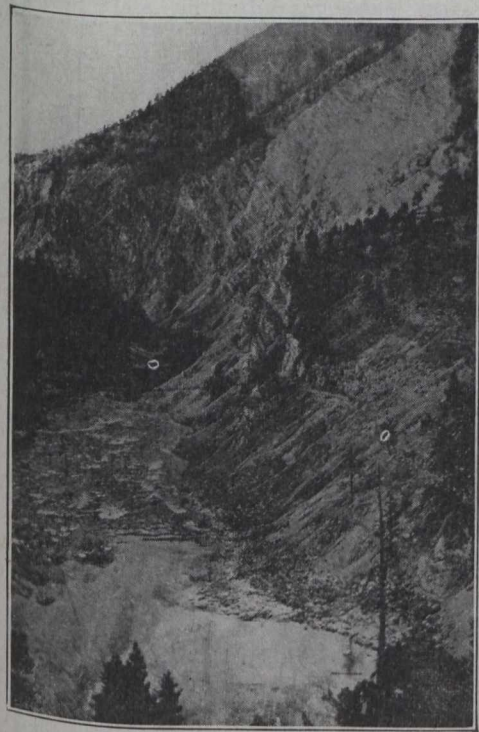
FROM	TO	Miles	Eastbound trains		Westbound Trains	
			Ruling grades	Other grades	Ruling grades	Other grades
Port Mann	Boston Bar	119	.40%-6.9 Miles	.70% .1% or less	8 vel. grades level and down hill	90% level or down hill
Boston Bar	Kamloops Jct.	124	.35%-3.4 "	.60% .2% " "	.40%-3 miles	80% " " " "
Kamloops Jct.	Blue River	141	.4 %-.30 "	.53% .2% " "	.2%-1.8 (Vel.)	90% " " " "
Blue River.	Yellow Head	111	.7%-25.5 "	.52% .3% " "	.4%-11.3 "	72% " " " "

inevitable, but for the sake of economy in construction it was desirable to reach the North Thompson Valley bottom as soon as possible, hence a seven tenths grade was introduced, striking the valley bottom at mile 406, or 10 miles below the mouth of the Albreda. From this point to Hell's Gate, mile 372, the Thompson falls 7 ft. to the mile and the line follows the river bottom. Thus the first operating division, end-

difficulty, by an easier one. The true ruling grade is that between the two crossings of the Fraser River south of Lytton, for this is a fixture. It is three tenths compensated and 3½ miles long. The fourth operating division is from Boston Bar to Port Mann. Against westbound traffic there are virtually no grades. While the ruling grade eastbound is four tenths compensated, 1.3 miles long. In the 500 miles from

the Yellowhead summit to Port Mann there are only 22.3 miles of adverse grades, or 4½% of the total distance. The maximum curvature throughout is eight degrees, and this has been used as sparingly as possible.

There were no particular engineering difficulties encountered in the surveys but plenty of hard work, and even danger. The procedure was that customarily in vogue. The crux of the problem lay between Birch Island and the Yellowhead Pass. Even here the main lines are well defined, and the alternatives few, the paramount difficulty being one of transportation and supplies. The country west of the Albreda summit was, at the time of the surveys, most readily accessible from Kamloops. This involved a pack train about 100 miles long. The physical difficulties in keeping a survey party equipped with supplies, quite apart from the strenuous work of the survey itself, makes this piece of location a most praiseworthy one. During the winter months communication was entirely cut off, except for the monthly trips of the mailman. The records of these trips are a story in themselves. The difficulties, however, were not over on the disappearance of the snow, for between that time and the rise of the rivers, which during high water are unfordable and covered large portions of the trail, there was only sufficient time for one trip of the pack train, and continuous packing could only be carried on after the floods had subsided and ceased in the autumn. Much credit is due to those who faced and



Gladwin Bluff, Above Lytton, Mile 151.

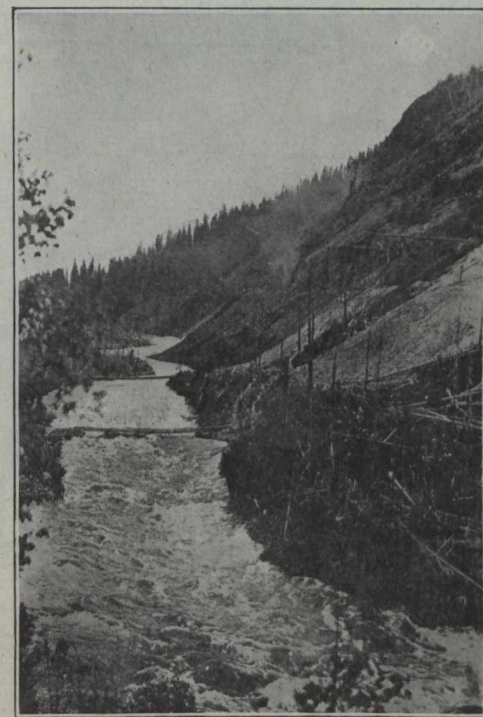
surmounted these difficulties. The first survey parties were sent out in May, 1909; construction was started from Port Mann to Hope in July, 1910; from Hope to Kamloops in Aug., 1911; from Kamloops to Birch Island in Oct., 1911; from Birch Island to the Yellowhead Pass in May, 1912; from the Yellowhead to Albreda in Aug., 1912, and from Blue River to the Albreda in May, 1913. The line should be open for operation by next autumn.

CONSTRUCTION.—We will now reverse our direction, and consider ourselves as going from west to east. For a railway passing through one of the main mountain regions of the world the work is, on the whole, extremely light. From Port Mann to

Rosedale, mile 47, the grading is largely prairie work, although spurs from the main mountain range give rise to heavier work at intervals. From Rosedale to Hope, mile 77, the work becomes heavier as the valley narrows, and still more so from Hope to Yale, mile 91; but so far there is nothing calling for special comment. At Yale the canyon proper is entered, and the heaviest work on the whole railway is encountered, the heaviest mile costing \$326,300, without fence, telegraph or track. From Yale to Boston Bar, 26 miles, the rock work is extremely heavy, and there are 15 rock tunnels, aggregating 8,321 ft. The rock is mostly granite, and bluff follows bluff, all with almost perpendicular faces. A great deal of this rock was shot into the river, but a surprising number of fills were successfully constructed. As the rock was largely in huge masses, partly owing to its rough nature, and partly owing to the fact that it was often separated into large blocks by natural seams, these fills are well calculated to stand even the Fraser floods. This piece of line was perhaps the most difficult one to locate and cross section. From Boston Bar eastward, gravel is frequently encountered; indeed, from mile 128 to Savona, mile 218, there is almost more steam shovel work than anything else. The heaviest yardage is in the neighborhood of Tilton Creek, mile 130. Here cuttings aggregating 414,000 cu. yds., were led to one large fill. Jackass Mountain, extending from mile 134 to 134.5, consists of massive conglomerate and shale, the yardage for this half mile was 182,000 cu. yds., with two tunnels aggregating 548 ft. One of these tunnels was, however, carried out in an enormous slide in the hill side on the night of Nov. 18, 1912, which followed a period of heavy rain about six weeks after the tunnel was finished. The formation through which the tunnel was driven was very broken. A large black shale seam about 2 ft. wide, which made an angle of about 20 degrees with the vertical, and 30 degrees with the centre line of the tunnel, crossed the line of the tunnel about one third way through from the east end, separating the country rock on the upside from an overlying rock formation on the other. This overlying material was very broken, and interspersed with soft clay. It seemed to be debris from the mountain side above, and bore no relation to the country rock. Whether the hill slid on the shale seam, or whether the clay, swollen by the heavy rains, exerted excessive pressure on the tunnel timbers, causing them to collapse, thus releasing the toe of the hill, it is impossible to say. The whole slide had been removed, and the hill side dressed to an apparently safe slope, when three weeks later, on Aug. 25, 1913, another slide of considerable magnitude occurred. This was in turn removed, and the slope redressed, leaving now an open cutting, probably safer than any other part of the mountain.

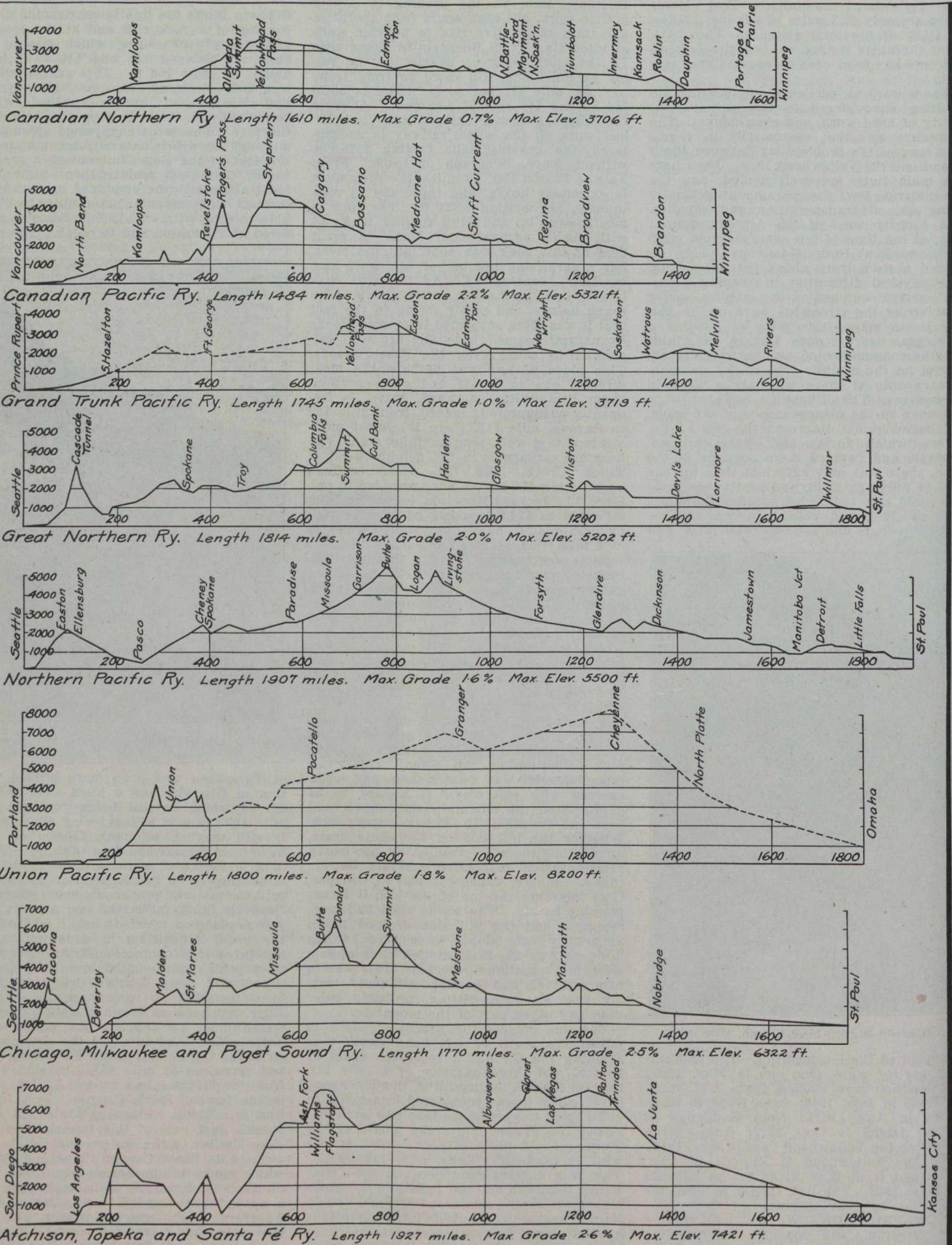
The line crosses the Fraser at Cisco to follow the north or left hand bank, thus avoiding the C.P.R. It recrosses again at Lytton, and three quarters of a mile further on crosses the mouth of the Thompson River, since it was considered less costly to build these two crossings than one large one across the Fraser, above the mouth of the Thompson. A piece of heavy work is met with at Gladwin's Bluffs, mile 149 to 151. This is a contact zone between the Coast Range Batholith and the Paleozoic Schistose rocks, the whole traversed by many Tertiary dykes and Chonolithic intrusions. It is a particularly awkward place on which to locate. The quantities for this two miles of work are as follows:—478,946 cu. yds. of excavation and 990 lin. ft. of tunnel. The average cost per mile is \$222,650, without

track, telegraph or fence. Just beyond the Gladwin Bluffs the line is constructed along the top of a rock cliff and at the foot of immense gravel slopes, which rise at an angle of between 1¼ and 1½ to 1 to a height of some 700 ft. This gravel, which was well cemented, was excavated by the hydraulic method; excess roadbed width being allowed, depending on the height of the face. The faces have stood splendidly, although the debris naturally accumulates at the foot of the slope, but not to a greater extent than such maintenance forces as must necessarily be employed by a railway through such mountainous country, will be able to cope with. Bad bluffs were encountered at Thompson and Drynoch. The rock



Grading Chutes, Mile 30 West of Yellowhead Pass.

at Thompson was even more broken than that at Gladwin, and a huge slide has occurred which is still being removed. At mile 162 there is a heavy clay slide, which is still moving, although 350,000 cu. yds. have been removed to date (Feb. 3). There is no evidence of water seepage, and there is nothing to do but to keep on excavating until the material reaches its angle of repose. Drynoch Bluff, mile 163, was a most dangerous place on which to locate, and offered the usual difficulties in construction. It has three short tunnels and the open slope is very high, surmounted by a good deal of gravel and other debris. Crib traps have been installed at various points on this slope, but here, as in other places, constant watch must be kept by the maintenance organization. At mile 184 the line crosses on to the C.P.R. side of the Thompson River and recrosses at mile 188.5, passing direct from the bridge into a tunnel, 1,319 ft. long, in the famous Black Canyon. This formation is a black cretaceous shale and sandstone. Just east of this tunnel there is a slide similar to the one on the C.P.R. side, west of its Black Canyon tunnel. A spring, which made its appearance about one third of the way down the slide, was tapped by a water tunnel and led to an adjacent gully. At every high water, however, the slide moves and has moved for some 120 ft. since the records were first taken. It is thought that this is due partly to saturation from the melting snow, and partly from the action of the high water in the river, although what



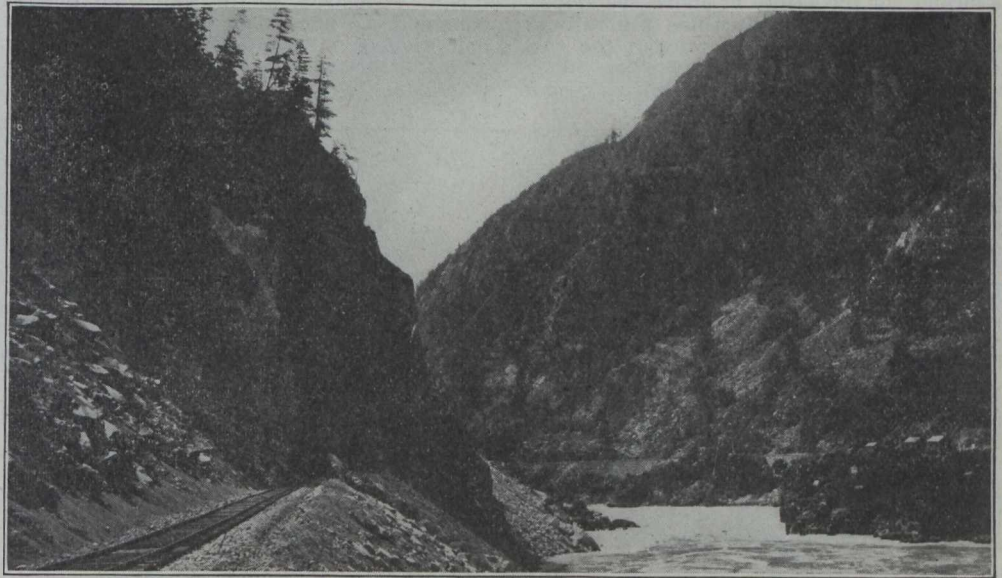
Comparative Profiles of Railways Crossing the Western Mountain Ranges.

happens exactly is not yet understood. Borings showed 26 ft. of clay and then gravel, but they were not taken down through the gravel.

Some two miles further east the grade was first constructed at the foot of the bluff, partly in cut and partly in fill, the latter standing well until the flood of 1913. An extensive crib is now being constructed at this place. From Ashcroft, mile 194, to Savona, mile 218, it is almost all steam shovel work in glacial clay. Rock work is again encountered along Kamloops Lake, including a tunnel at Battle Bluffs, 2,835 ft. long. At mile 244, the line crosses to the east bank of the North Thompson. Immediately east of the bridge is the Kamloops division yard. Between Lytton and Kamloops there are three crossings and recrossings of the Thompson River, to avoid heavy clay bluffs, the work on the C.P.R. side at these places being generally very light. From Kamloops Jct., mile 243, to Birch Island, mile 324, the work is easy on the whole, although occasionally the line hits a rock slope with some severity. From Birch Island to the third crossing of the Thompson River at mile 339 there is heavy steam shovel work along the supported grade. From mile 330 to the fourth crossing at mile 351, although the work was largely steam shovel material, it was entirely carried out by hand, owing to the difficulty of getting in machinery. There is little to call for comment from here on, except to refer to the extraordinarily light work across Stillwater Flats, until the supported grade is reached at mile 360 to 376 (Canoe Landing). This is the heaviest portion of the North Thompson River work, particularly at Hell's Gate, where the river passes through a miniature Fraser canyon, involving heavy rock cutting and two small tunnels. From mile 376 to the next supported grade at mile 406, the work is extraordinarily light for a mountain railway. From mile 406 to 417 extends a region of heavy sand, gravel and clay cuttings and tunnels, one of these

a group of 32 piles, capped by a three course grillage of 12 by 12 timbers. This in turn is topped by a 1 in. steel plate, bored to receive the anchor bolts from the girder bearings. Placed about the piling is a timber crib pointed on the up stream and square on the other end. These cribs are not attached to the piling, but form a sleeve, and are sufficiently free of the piling to permit their sinking, as they are built up from the water surface. The tops are completed to about 5 ft. above high water and then are

particularly great for the last ten of these miles, owing to the fact that the grade had to be constructed immediately above the G.T.P.R., then in operation. The two lines run on the north shore of Moose Lake, side by side as double track. From Moose Lake the G.T.P.R. falls with a 1%, and the C. N.R. with a seven tenths compensated grade. Hence the two lines rapidly diverge in elevation but remain very close in alignment. All mucking over this portion from the C.N.R. had to be carried across the



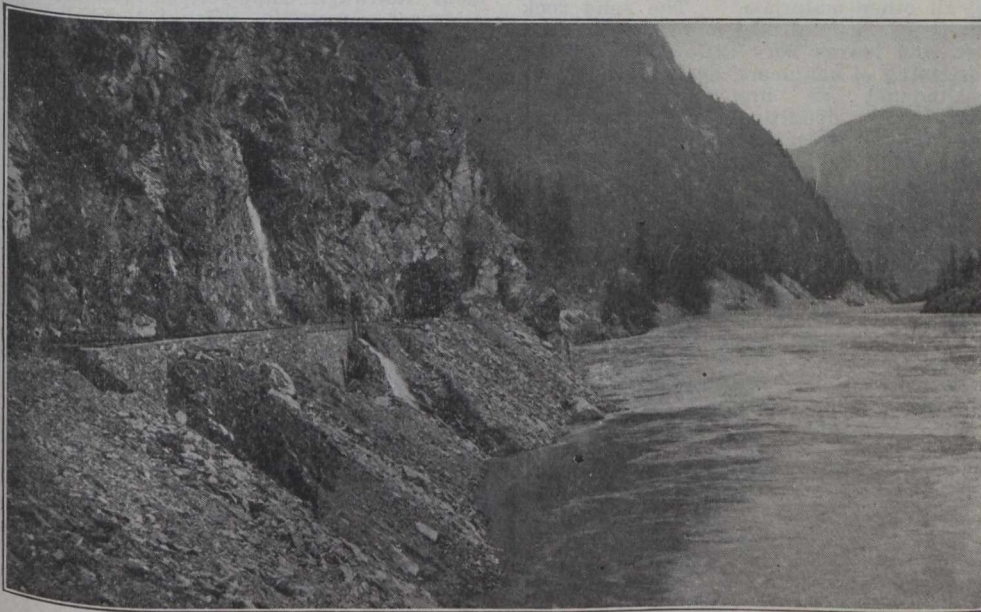
Hells Gate, Fraser Canyon, Mile 110.6.

rock filled. The third crossing is a temporary pile bridge below the permanent crossing, which will be of concrete piers. The other two crossings are low and short, and are over wooden pile bridges. From mile 425 to Canoe River crossing at mile 436 the rock work is fairly heavy, although

G.T.P.R. on trestles and shot direct into the Fraser River. Six of these trestles and chutes were constructed. From Moose Lake to Yellowhead the work calls for no special comment, as it is light, and the valley wide and uniform enough to provide an easy route for both railways.

There is not much in this work of interest to railway engineers, except the bridging; the steam shovel work in gravel and clay, and the resulting slopes; the rock blasting; the classification. As the steel bridges were designed and entirely under the supervision of Waddell and Harrington, consulting engineers, the author does not propose to make any reference to them, beyond showing some views in the hope that a paper will be read some day before the Canadian Society of Civil Engineers by a member of Waddell and Harrington's firm.

In regard to the steam shovel work in gravel and clay, and the resulting slopes, no one would deny the value of steam shovels, or their necessity, if such work as is now being described, is to be carried on economically and expeditiously. At the same time the engineer would be delighted to dispense with them, were that possible, unless the material was being excavated to a final angle of repose. In some cases this was done, but speaking generally such a plan is a counsel of perfection, and not economically practicable. The difference in yardage between 1 to 1 slopes and 1½ to 1 slopes, on side hills that extend upwards for hundreds of feet, is self evident. Moreover, in most gravel cuttings, a 1 to 1 slope, if not permanent, would give very little trouble for a number of years, when it could be economically handled by steam shovels with mainline equipment. But when 1 to 1 quantities are dug by steam shovel and the slopes left standing nearly plumb, it means that the company has frequently to face comparatively heavy further excavation expenditure after the line is opened. Sometimes a portion of the slopes



Mullen Bluff, Fraser Canyon, Showing Tunnel 6, Mile 98.31.

latter being 1,000 ft. long. All this work is done by hand, as it is not practicable to take in machinery. From mile 417 to the Albretha Summit, the work is again very light, indeed at the summit itself it would be cheap for prairie country. The two crossings and recrossings of the North Thompson are to avoid heavy work, and to get better alignment. The first two of these crossings are 80 ft. deck plate girders, supported on pile piers, consisting of

there are a good many gravel cuttings also. Canoe River is crossed on a steel viaduct. From this point to mile 445 the work would be light even on the prairies. No really heavy work is encountered until the Fraser Valley is entered at mile 453. From this point the Grand Trunk Pacific is paralleled and the two roads are never more than a few hundred yards apart. From mile 456 to Moose Lake, mile 472, there are some very heavy rock cuttings. Difficulties were

in steam shovel work was lightened by having the top hand sloped, but in the more cemented gravels and harder clays, the slope was left as dug by the steam shovels. Undoubtedly, all things being equal, unless the quantities to be excavated in the first instance are those contained by slopes at the angle of repose, hand slope work is infinitely more satisfactory than steam shovel work. Most of the gravel and clay lies in the dry belt, otherwise it may be supposed there would be little left. Hence the conditions on this construction were unusually favorable for the safety of undressed slopes.

One of the main difficulties the railway engineer encounters is to prevent the contractor from using too much powder. Such work as is here described is usually car-

his warnings and instructions are neglected. From the experience of this work the author is strengthened in his convictions that more than from 1 lb to 1½ lbs. of explosive to a cubic yard of excavation is needed only in very rare cases; and in ordinary sandstone and limestone, if at all seamed, ¾ lb. per yard would generally be sufficient. For shales ½ lb. or less is plenty.

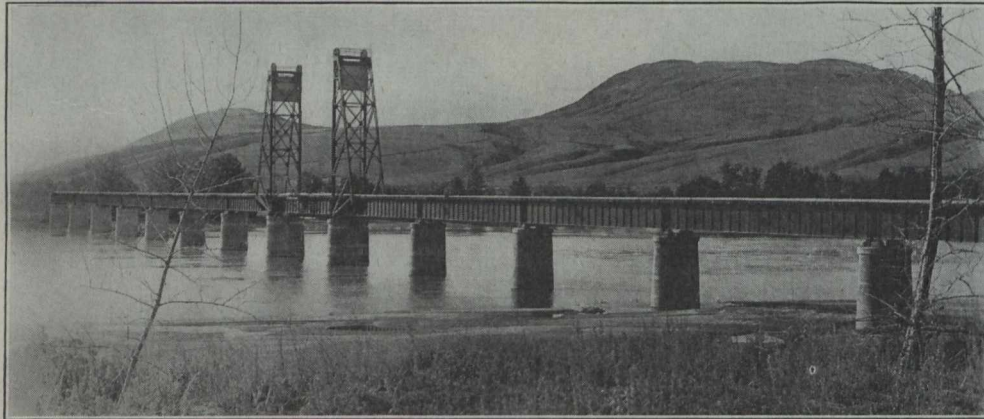
From Port Mann to Hope, and from Kamloops to the Yellowhead Pass, four classifications were used in accordance with the C.N.R. standards, as to which no special comment is necessary, except as to the definition of solid rock, which is the same through the whole work. From Hope to Kamloops there are only two classifications,

Chicago, Milwaukee and Puget Sound... 2.5% 6,322 ft. 1,770
Atchison, Topeka and Santa Fe 2.6% 7,421 ft. 1,927

Tilton Creek Culvert.—Mr. Nimmo has given us the following data about this culvert:—Height from grade to top of culvert at the junction with the tunnel, 137 ft. The culvert is 21 ft. 7 ins. wide, 19¾ ft. high, giving an opening of 312 sq. ft. The tunnel was taken out a foot wider than the culvert to allow for future lining. The length of tunnel is 300 lin. ft., and of the culvert, 226 ft. There are 3,150 cu. yds. concrete in culvert, and 90 cu. yds. in tunnel lining. The total cost of the water tunnel and culvert was about \$70,000.

Kamloops Bridge.—This structure, over the North Thompson River at Kamloops, is a deck girder bridge, 1,209 ft. long, and has a deck girder lift span 93 ft. long. There are 12 fixed spans, also of 93 ft. length. Approaches at both ends of the bridge, of timber trestle construction, total about 1,100 ft. The lift span weighs 118 tons, and is fully counterweighted. The sixteen 1¼ in. lifting cables are equalized in the attachment to the span. Centring castings provide for keeping the span in proper alignment as it comes down to bearing, and also take the longitudinal braking thrust. The lift of the span is 53 ft., giving a 55 ft. clearance above high water. The motor is capable of raising the span in 100 seconds. The lifting power is a gasoline engine, which, with all the machinery, except the operator's levers, is located below the deck, at the middle. Limit switches coming into operation near the ends of travel of the span control the igniter circuit of the engine.

The bridge was designed by Waddell and Harrington, of Kansas City, Mo. The lift span is built with the arrangement and details used by them in their various lift bridges built in recent years.



Deck Girder Bridge, With Lift Span, Over North Thompson River, Near Kamloops.

ried out by stationmen working under sub or sub-sub contractors of the main contracting company. The stationman, who seems to live in a state of perpetual hope, is strongly tempted to over shoot, with a view to breaking up his rock as small as possible, and to save handling, where, as was largely the case on this work, the material was wasted direct into the river, whose course the railway is following. That this may result in over-break the stationman is well aware, but his faith and hope in the engineer's charity will induce him to chance the disallowing of the over-break. If allowed, he stands to gain heavily. Besides there are seams, which with a little flattery and talk about the experience of the engineer, etc., etc., he may hope to pass off as the cause of the over-break. Indeed the engineer will often be in a quandary to know whether the rock, even though lightly shot, would not have broken to a clearly indicated seam. The sub contractor has little inducement to check the stationman from overshooting, for the more powder the stationman uses, the more profit the sub contractor stands to make. If no more than the estimated yardage is paid for, the sub contractor makes at least as much profit as he set out to make, and if over-break is included he is that much to the good. Thus with blarney and bluster pressure is brought to bear on the engineer on all sides, which it is frequently very hard to resist, especially by the younger members of the profession. The Canadian Society of Civil Engineers excludes in its Standard Specifications the use of powder in large blasts in seams, drifts, shafts and coyotte holes. This again is merely a counsel of perfection, nor would its strict enforcement tend to economy. The remedy must always be in the judgment and experience of the engineer in charge, who should make a point of at once warning the contractor against the results of heavy shooting, as soon as he sees any signs of such a course being proceeded with, and hold him strictly to account if

which read as follows:—"All stones or boulders found in excavation measuring more than 27 cu. ft., and all solid quarry stone requiring blasting in order to remove it, shall be termed 'solid rock.'" "All other materials other than solid rock as described above, shall be termed 'all other materials,' and paid for at the schedule rate for 'all other materials.'" The solid rock definition is a great deal more definite than most, and leaves very little room for the questioning of engineers' decisions. It may be thought at first sight that this solid rock definition and the two material classifications would remove many of the classification difficulties, which all engineers have to face. In practice, however, even through country where as in this case the material can be broadly classed as rock and gravel or clay, grades of rock are met with, which although strictly coming under the "other material" classification, must in equity, be allowed for in part as solid rock, and one is again left with the conclusion that no specification can be drawn up which does not require to be interpreted on the broad grounds of professional intelligence and common sense.

The foregoing paper was read before the Canadian Society of Civil Engineers, Vancouver branch, recently. We are indebted to T. H. White, M. Can. Soc. C.E., Chief Engineer, C.N.P.R., for the diagrammatic profiles accompanying the paper, and for the photograph of the Kamloops bridge; also to the author of the paper, Mr. Nimmo, for the photographs from which the other illustrations have been made.

Comparative Profiles.—Following are figures relating to the comparative diagrammatic profiles given of eight transcontinental railways:—

	Maximum Grade.	Maximum Elevation.	Length Miles.
Canadian Northern	0.7%	3,706 ft.	1,610
Canadian Pacific	2.2%	5,321 ft.	1,484
Grand Trunk Pacific	1.0%	3,719 ft.	1,745
Great Northern	2.0%	5,202 ft.	1,814
Northern Pacific	1.6%	5,500 ft.	1,907
Union Pacific	1.8%	8,200 ft.	1,800

Imperial Service Medals for long service have been awarded to Canadian Government Railways employes, as follows:—J. Anderson, foreman, Moncton, N.B.; T. Bowes, shed foreman, Halifax, N.S.; J. Enman, station master, Summerside, P.E.I.; F. E. Harrington, ticket agent, St. John, N.B.; J. W. Henderson, conductor, Moncton, N.B.; R. Howell, machine man, Moncton, N.B.; J. Kennedy, machinist, Moncton, N.B.; W. M. Kingston, baggage master, St. John, N.B.; D. LeBlanc, track man, Moncton, N.B.; D. H. Lockhart, fitter, Moncton, N.B.; T. McCurdy, section foreman, New Mills, N.B.; D. McKenzie, fitter, Sydney, N.S.; A. McKim, baggage man, Moncton, N.B.; J. A. McMullan, track foreman, Pugwash, N.S.; J. Martin, station master, St. Fabien, N.B.; D. Montgomery, station agent, Georgetown, P.E.I.; F. Morin, section foreman; G. Murray, foreman carpenter, Truro, N.S.; P. Murray, spring maker, Moncton, N.B.; A. Ormiston, general foreman, Truro, N.S.; J. Patterson, track master, Campbellton, N.B.; A. Patterson, seamstress, Halifax, N.S.; J. Royer, baggage master, Campbellton, N.B.; J. Scott, tank man, Alton, N.S.; G. Souci, conductor, Riviere du Loup, Que.; W. Spear, freight checker, Sussex, N.B.; D. Stewart, repairer, Mulgrave, N.S.; J. Stewart, repairer, Mulgrave, N.S.; J. Stratton, engine man, Moncton, N.B.; J. Wood, section man, Kent Jct., N.B.; and C. Wood, section man, Kent Jct., N.B.

The preservative value of salt is said to have been demonstrated in the Great Salt Lake district of Utah, where, in the replacement of a timber trestle the engineers found the piles perfectly sound after 43 years' service. The same action is not met with in ocean waters, as the latter are not sufficiently strong, the Great Salt Lake water being practically a saturate solution.

Mikado Locomotives for the Canadian Pacific Railway.

By T. C. Chown, Leading Draughtsman, Motive Power Department, Canadian Pacific Railway.

During the autumn of 1913, the C. P. R. had built by the Montreal Locomotive Works, 75 mikado locomotives, having a tractive effort of 42,000 lbs., 23½ by 32 in. cylinders, 180 lbs. boiler pressure, and of a total weight in working order of 258,000 lbs. They are very similar in design to the 20 designed and built by the C. P. R. in its

and valve gear as far forward as the lifting link, are all interchangeable with those on the consolidations. From the lifting link back, the motion was changed to use the screw reverse gear. On the last order of 75, the cylinders were changed to bring the valve chest out to within ½ in. of the centre line of the cylinder, so as to elim-

passes through the combination lever, crosshead guide block and both arms of the rocker.

The valve stem guide is similar in design to that of the usual type of small stationary engine crosshead, being semi-circular top and bottom, with babbitted faces, which have the advantage of being renewed to compensate for any wear, by rebabbiting and turning to suit the valve stem guides on the cover. All other parts of the motion, with the exception of the combination lever,

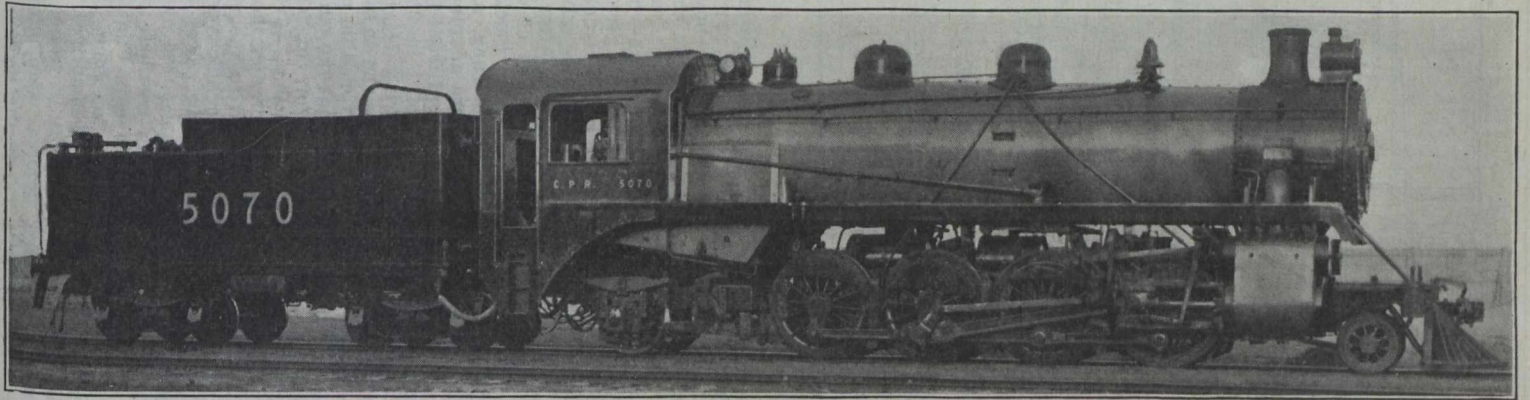


Fig. 1.—Mikado Locomotive, Canadian Pacific Railway.

Angus shops, Montreal, during the autumn of 1912, for service on the Lake Superior division, which is recognized as one of the hardest on the whole system to operate, especially in the autumn and winter when the severe climatic conditions to be contended with, have to be given special consideration. It extends largely along the north shore of Lake Superior, through a

inate the long rocker arm that was necessary in the other design to cross the motion over to the valve chest, which was located over the frame.

To make this alteration, a new combination back steam chest cover and valve stem guide was designed, similar to that applied to some lighter consolidations in 1908, as it had been found that these latter had

are interchangeable with those on the original order. The driving boxes are of cast steel; the hub facing and shoe and wedge faces are of brass, cast directly on the boxes. The idler and engine truck boxes also have cast brass facings.

The boilers are of the extended wagon top type, with an outside diameter at the first course of 72 ins., and at the dome

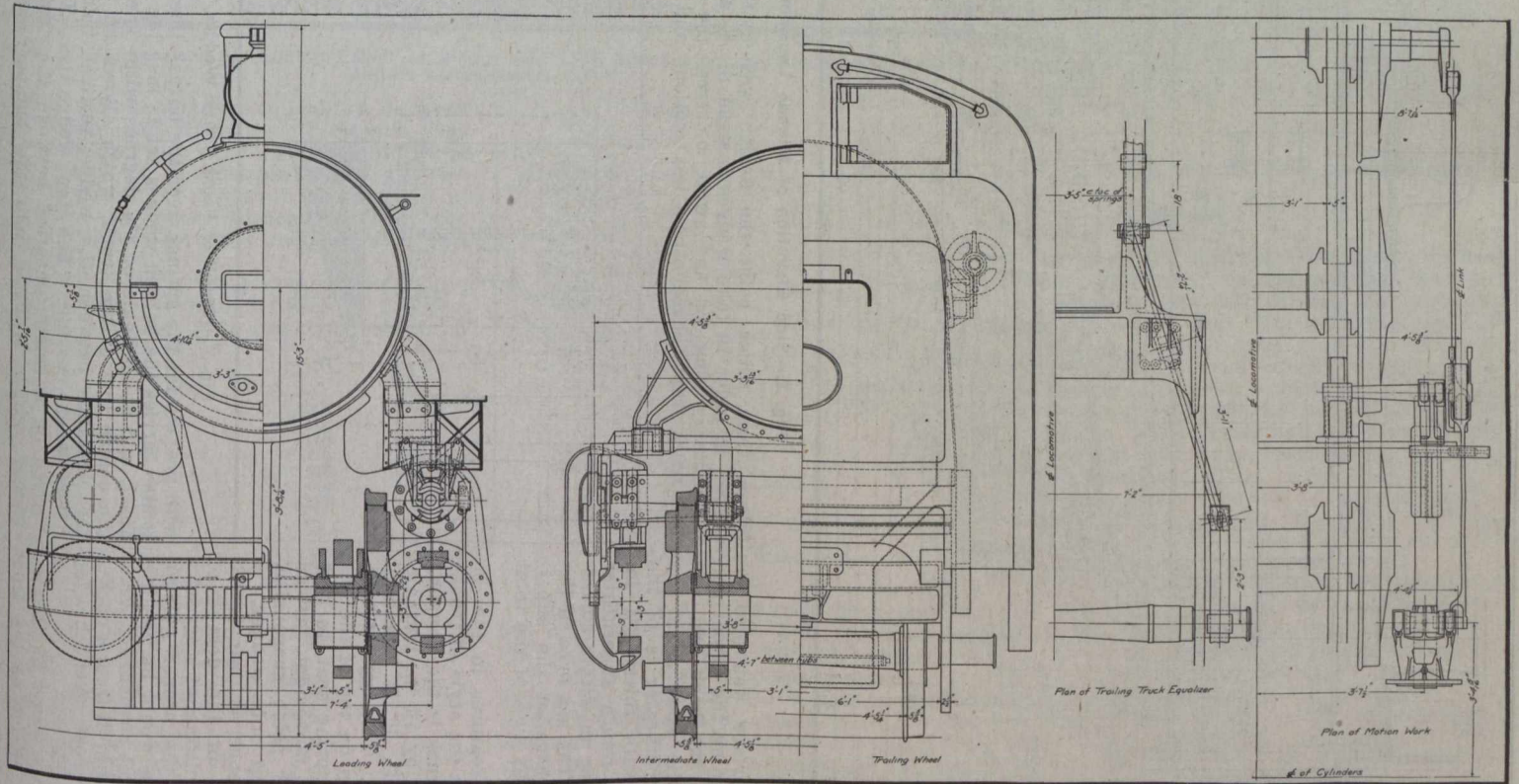


Fig. 3.—Cross Sections and Plan of Trailing Truck Equalizer and Motion Work on Mikado Locomotives, C.P.R.

rough and barren country, making operating conditions particularly severe.

In designing the original order of mikados, the C. P. R. took its standard consolidation locomotive as a base to work from, using all standard parts wherever possible. The cylinders, pistons, piston rods, cylinder covers, wheels, axles, driving boxes, rods,

given excellent service, requiring very little attention between shoppings of the locomotive. This cover consists of a double rocker arm 12 ins. long, which fits over both sides of the valve stem guide, with bosses of sufficient length to permit of the combination lever being applied on the outside of the guide and crosshead. One long pin

course, of 79 ins. Both radial and cross stays are used in staying the firebox. The length of the flues between the fire sheets is 20 ft. 7¾ ins., as opposed to the 15 ft. 1¾ in. tube length of the consolidations, giving an approximate increase of 13.7% in the tube heating surface, with a corresponding increase in the superheating surface.

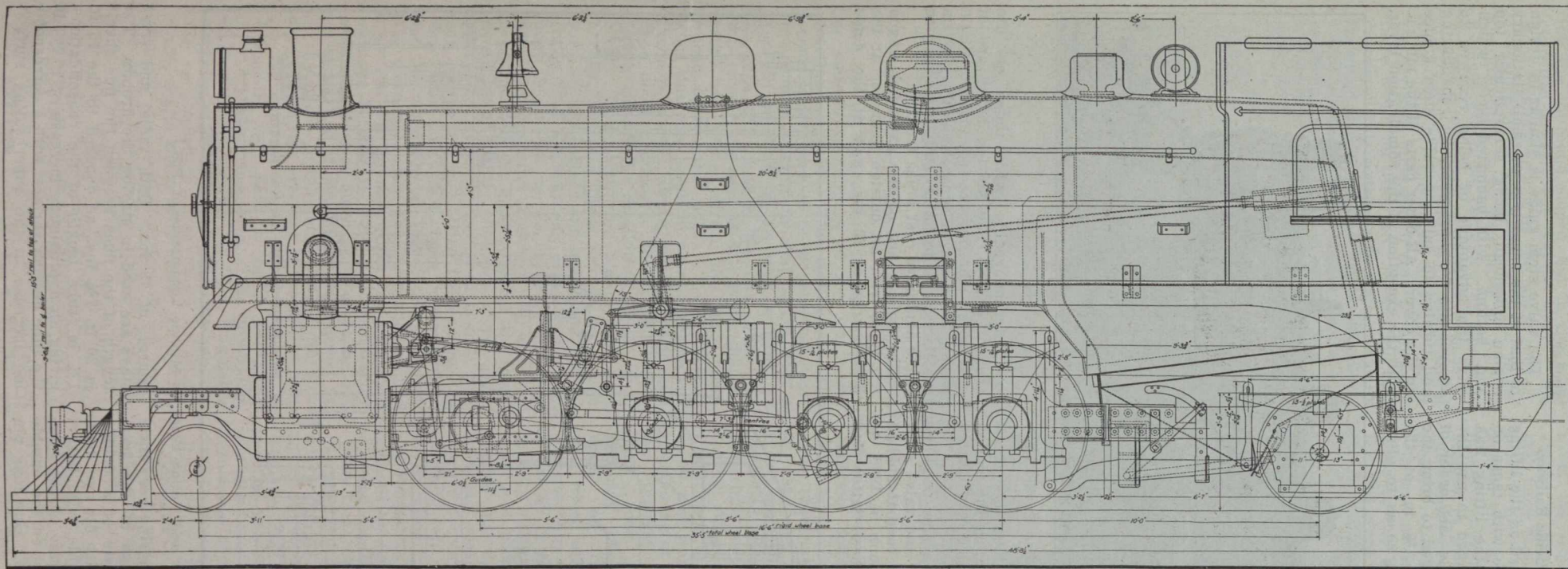


Fig. 2.—Side Elevation of Mikado Locomotives, Canadian Pacific Railway.

The firebox heating surface was also increased 11.4% by deepening the throat and lowering the grates at the back end, the grate area remaining the same as in the consolidations. The superheater is of the Vaughan-Horsey type, with thirty $5\frac{1}{4}$ in. flues and sixty $1\frac{1}{4}$ in. return superheater units, the latter extending to within 30 ins. of the back flue sheet. The gas area of the $5\frac{1}{4}$ in. flues, less the area of the superheater units, is practically 40% of the total tube gas area.

One of the principal features in the design of these mikados, is the style of trucks adopted. The trailing truck is the Vaughan outside bearing, with 7 by 14 in. journals, the same as on the C. P. R. standard Pacific type locomotives. This type of bearing has taper wedges set on top of the box and the bottom of the spring seat, to take up the necessary lateral movement, instead of having the usual 3 point suspension. With this arrangement of wedges, a constant lateral resistance is transferred to the rail, regardless of the degree of curvature, thereby permitting of a greater flexibility in adjusting the proper guiding power to the truck than would be possible in the case of the 3 point suspension. The wedges are lubricated with oil from a pocket formed in the spring seat over the top wedge.

The front truck is the same as that on the consolidations up as far as the truck

frame, from which point the design was altered in order to take wedges instead of the ordinary king pin and swing bolsters. This truck frame is made of a box section,

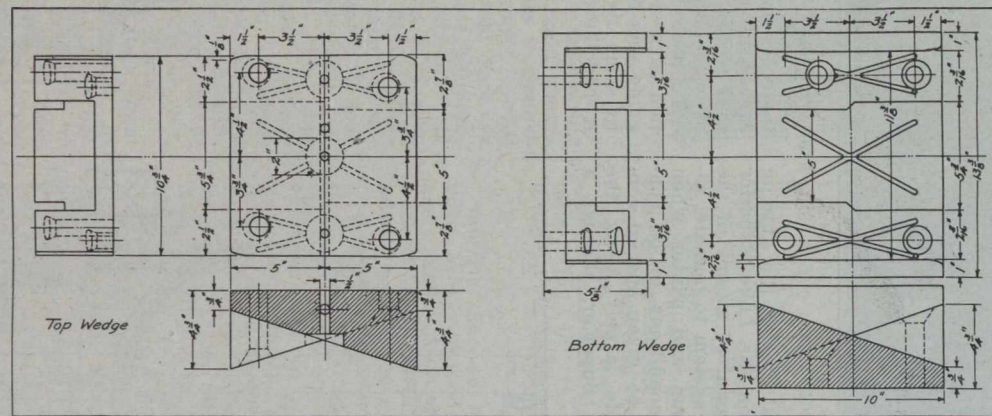


Fig. 4.—Detail of Front Truck Wedges, Mikado Locomotives, C.P.R.

with pockets for the springs over the boxes. It also carries the bottom wedges set 18 ins. apart, and at an angle of $8\frac{1}{2}$ degrees with the centre line of the truck, which allows for clearance between the wedge vertical edges when curving. The top wedge is carried on a bolster inserted between the frames, which is fitted into the bumper

casting sidewalls with a total side play of $\frac{3}{8}$ and $\frac{1}{4}$ in. respectively, front and back, the bolster being fitted with brass liners, and the bumper casting with cast iron

liners, which present an easy means of taking up excessive side play of the bolster. The front end of the truck equalizer rests on top of the bolster. The wedges of the truck are lubricated with hard grease.

The wedges on both trailing and engine trucks are designed with double faces having equal bearing surfaces, which permits

of a parallel movement upward at all times, with only one set of faces in service at a time. Fig. 4 shows details for the front wedges used on the front truck. A series of running tests were made on both trucks to determine the most desirable taper, one which would give the necessary guiding power to the trucks when running and at the same time give the required freedom on curves. After several such tests, in which wedges of different tapers were applied to both trucks, tapers of 1 in $2\frac{1}{2}$ for the front truck, and 1 in 6 for the back truck, were adopted. The guiding power of this style of front truck, with wedges having a taper of 1 in $2\frac{1}{2}$, in comparison with a truck having $7\frac{1}{2}$ in. swing links and 3 in. centres, is shown in the accompanying curve, fig. 5. From this comparison, it will be observed that the curve representing the guiding power of the wedge truck is a straight line, giving a constant guiding power for any movement of the truck, as compared to the variable guiding power of the swing link type, where an equal amount of guiding power is not obtained until the link has moved over about $1\frac{1}{2}$ ins.

The vestibule cab, which was fully described in Canadian Railway and Marine World for June, 1912, was also applied to these locomotives. It is completely enclosed, with entrance through a side door, a flexible connection being maintained between the locomotive and tender by means

of a spring maintained contact.

The tenders are of the combined tank and underframe type, with capacity for 7,000 imperial gallons of water and 16 tons of coal. They are equipped with hinged type coal pushers, which are operated by two 12 in. cylinders, controlled from the cab. The tender trucks are of the pedestal equalizer type, with cast steel bolsters, 6 by 11 in. axles, McCord boxes and inside hung brakes.

These locomotives are giving excellent satisfaction in freight service, and since the first of this year, two of them have been placed in passenger service on the

Driving, thickness of tires, ins.....	3½	3½
Engine truck, diam. over tires, ins.....	31	31
Trailing truck, diam. ins.....	54	54
Journals, driving, main, ins.....	10 x 14	10 x 14
Driving, others, ins.....	9½ x 14	9½ x 14
Engine truck, ins.....	6 x 11	6 x 11
Trailing truck, ins.....	7 x 14	.....
Boiler, style.....	Extended	wagon top.
Working pressure, lbs.....	180	180
Outside diam., first ring, ins.	72	72
Firebox, length and width inside, ins.....	103¼ x 69¾	102 ⅞ x 69¾
Firebox plates, thickness, ins.....	½, ¾, ⅞	½, ¾
Firebox water space, ins.....	5, 4½, 3½	5, 4½, 3½
Tubes, number and outside diam., ins.....	210, 2¼	210, 2¼
Flues, number and outside diam., ins.....	30, 5¼	30, 5¼

ward to profit and loss account, which now stands at \$91,189.60.

ASSETS.

Obligations on leases ..	\$14,380,208.33
Less unpaid	313,055.69
Cash in bank	\$14,067,152.64
Call loans	145,833.14
Debentures held by company a/c, C.P.R. and interest accrued on advances	240,000.00
	13,631,814.80
	\$28,084,800.58

LIABILITIES.

Capital stock subscribed ...	\$600,000.00
Capital stock paid up	\$ 240,000.00
Debentures outstanding	14,430.00
Interest accrued on same	6,666.67
Advances from C.P.R. against new lease ..	13,316,944.31
Balance at credit of profit and loss ..	91,189.60
	\$28,084,800.58

PROFIT AND LOSS ACCOUNT.

Balance at credit, Feb. 15, 1913	\$ 67,486.56
Rents received and accrued on leases and interest on advances and debentures held by company	712,783.93
	\$780,270.49
Interest paid and accrued on debentures ..	\$672,502.10
Expense account	878.79
Directors' fees last year	1,300.00
Dividend account	14,400.00
Balance carried forward	91,189.60
	\$780,270.49

MEMORANDUM re ROLLING STOCK.

Original cost of rolling stock held under existing leases	\$17,039,370.00
Amount paid in on account by railway companies in addition to interest ...	2,609,370.00
	\$14,430,000.00
Total amount of company's debentures outstanding	\$14,430,000.00

The officers for the current year are:— President, Sir Edmund B. Osler; Vice President, W. D. Matthews; Other directors:— Duncan Coulson, Hon. J. S. Hendrie, F. G. Osler, D. R. Wilkie; Secretary, G. F. Chisholm.

Dry Grass, Weeds, Etc., on the Right of Way.

The Board of Railway Commissioners has issued a circular calling railway officials' attention to sec. 297 of the Railway Act, which provides that "The company shall at all times maintain and keep its right of way free from dead or dry grass, weeds and other unnecessary combustible matter."

Attention is especially needed as to the annual growth of grass and other vegetation on rights of way, particularly through forest sections. This can, as a rule, be readily and safely burned off as soon as the snow has disappeared from the right of way, and while the adjoining lands are still too wet to permit the spread of fire.

Attention is also called to the necessity for a thorough clean up of yards and sidings, especially where the peeling and loading of timber has resulted in the accumulation of inflammable debris.

The work of burning or otherwise disposing of combustible matter on rights of way should accordingly be begun at the earliest possible date in the spring and prosecuted vigorously until completed. As required by regulation 9 of General Order 107, such supervision of burning must be provided as will prevent fires from spreading beyond the strip being cleared.

The Board requests the submission of statements showing what arrangements have been or will be made for handling this work on the various lines.

The Lackawanna Rd. is to build a new station at Buffalo, N.Y.

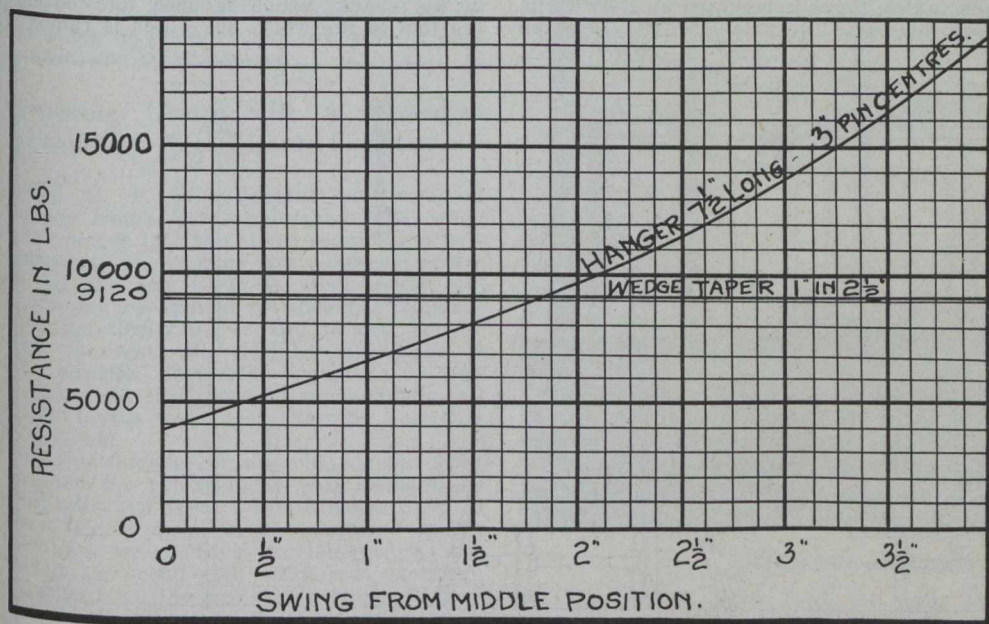


Fig. 5.—Comparison of Guiding Power of Wedge and Link Suspensions on Locomotive Trucks. Mikado Locomotives, C.P.R.

main line from Montreal to Halifax, between Sherbrooke and Megantic, which is a very hilly country, with a ruling grade of 1.72%, over which it is possible with the new motive power, to maintain a schedule of 30 miles an hour, dispensing with the double headers formerly required over this division.

The following gives a comparison of the weights, dimensions and ratios of the new mikados and the older consolidations from which they are based:

Type.....	2-8-2	2-8-0
Class.....	P-1	N-3
Service.....	Freight	Freight
Fuel.....	Bituminous	Bituminous
Tractive effort, lbs.....	42,000	42,000
Weight, lbs., working order.....	258,000	220,000
On drivers.....	198,000	198,000
On leading truck.....	25,000	22,000
On trailing truck.....	35,000	.....
Locomotive and tender, working order.....	428,000	362,000
Wheel base, driving.....	16 ft. 6 ins.	16 ft. 6 ins.
Total.....	35 ft. 5 ins.	25 ft. 5 ins.
Locomotive and tender.....	66 ft. 5 ins.	53 ft. 4½ in.
Weight on drivers—tractive effort.....	4.7	4.7
Total weight—tractive effort....	61.5	52.4
Tractive effort x diam of drivers—equivalent heating surface.....	560	762
Total equivalent heating surface—grate area.....	94.8	70
Firebox heating surface—total equivalent heating per cent....	3.97	4.75
Weight on drivers—total equivalent heating surface.....	41.8	57.0
Total weight, total equivalent heating surface.....	54.5	63.4
Volume of both cylinders, cu. ft.....	16.06	16.06
Total equivalent heating surface—volume of cylinders.....	294.4	216.2
Grate area—volume of cylinders.....	3.11	3.08
Cylinders, Kind.....	Simple	Simple
Diameter and stroke, ins.....	23½ x 32	23½ x 32
Valves, kind.....	Piston	Piston
Diameter, ins.....	12	12
Maximum travel, ins.....	6 in.	6 in.
Lap and lead.....	1 in. and ¼ in.	1 in. and ¼ in.
Inside clearance.....	Line and line	Line and line
Wheels, driving, diam. over tires, ins.....	63	63

Tubes, thickness, IWG number.....	11	11
Flues, thickness, BWG number.....	8	8
Length over tube sheets..	20 ft. 8½ ins.	15 ft. 2¼ ins.
Heating surface, tubes, sq. ft.....	3,410	2,495
Firebox, sq. ft.....	188	165
Total, sq. ft.....	3,598	2,660
Superheating surface, sq. ft. Equivalent heating surface, sq. ft.....	760	545
Superheating tubes, diam., and thickness, ins.....	4,738	3,477
Superheating tubes, average length.....	1¼, ☆	1¼, ☆
Grate area, sq. ft.....	19 ft. 4½ ins.	13 ft. 10½ ins.
Tender, style.....	50	49.6
	Combined tank and underframe.	
Journals, ins.....	6 x 11	5½ x 10
Water capacity, Imperial gallons.....	7,000	5,000
Coal capacity, tons.....	16	12

Victoria Rolling Stock and Realty Co. of Ontario, Limited.

Following are extracts from the report for the year ended Feb. 15, 1914, presented at the annual meeting in Toronto recently:—

During the year the company arranged for a new lease with the C.P.R. Co. amounting to \$14,100,000 against mixed rolling stock, and pending further arrangements the C.P.R. has advanced to this company the full cost of the rolling stock delivered to date and hold as collateral against this advance the balance of the outstanding debentures.

During the year outstanding debentures against leases have been reduced by \$630,000. All payments during the year have been promptly met. The profit on the year's business, after charging up directors' fees and expense account, is \$38,103.04, out of which a dividend of 6% per annum on the paid up capital stock has been paid, amounting to \$14,400, leaving \$23,703.04 carried for-

Railway Mechanical Methods and Devices.

Wheel and Axle Hoist of Canadian Northern Railway.

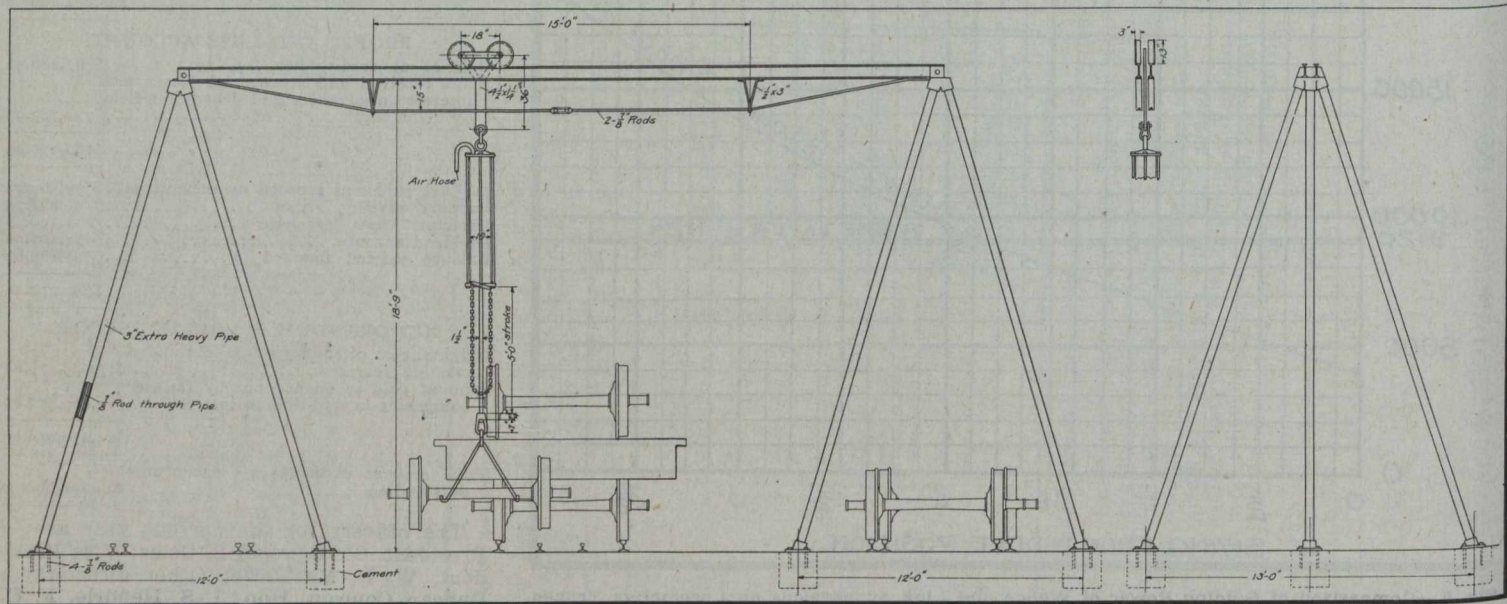
The C. N. R. has adopted as standard practice, the wheel and axle hoist shown in the accompanying illustration, and the arrangement has been found most useful in the expeditious handling of wheels and axles in and out of the shop. It consists of an overhead travelling hoist used for loading and unloading car wheels from the storage yard to flat cars for transmission to

for storing the wheels as they come from the machine shop, the hoist serving both pairs of tracks as well as the central feeder tracks. With this hoist, it is said that two men can load or unload a car containing from 14 to 18 pairs of wheels in from 15 to 20 minutes.

The narrow gauge service track car is of interest from the peculiar design. There are two pairs of 12 in. wheels mounted on 2½ in. axles, at 7 ft. centres. On each of these axles, there is mounted an 8 by 12 in. block, bolted to the axle journals. Between

This is threaded into one arm of a right angle head member, this latter bearing up against a shoulder on the taper shank. Making the tool in two parts like this has the additional advantage of renewal of the head in case the latter is injured. The turning tool is carried at an angle in a slot in the projecting arm of the head, and is held in position with a set screw.

In the centre of the outer end of the shank there is a ¾ in. pin, a working fit in the shank, which is used for centring the tool to the work, but which is removed



Wheel and Axle Hoist on Canadian Northern Railway.

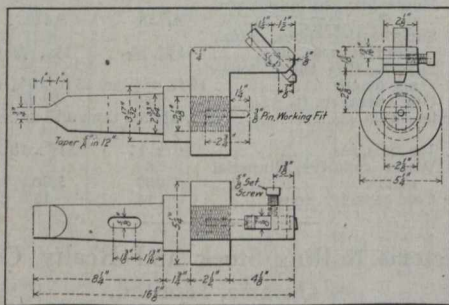
other points on the system, or on shop cars, for transferring into the shop for remounting, etc.

The runway consists of a 30 ft. span, made up of two 6 in. 17.25 lb. I beams, placed side by side at 6 in. centres. Each I beam is trussed by a ¾ in. truss rod bearing up against 15 in. truss rod struts at 15 ft. centres. The ends of the runway are supported on pipe tripods, these latter consisting of 3 in. extra heavy pipe, through the centre of each which passes a ¾ in. rod, with a nut on each end. Each tripod leg fits into a triple cap at the top, and cast iron shoes at the bottom, these latter resting on concrete foundation blocks, 20 ins. square, let into the ground, and grouted on top. They are secured in place by four bolts in each block, the lower end of each block being fitted with a washer.

The trolley has two pairs of 12 in. wheels at 18 in. centres, mounted on 2½ in. axles. A Y-shaped hanger, made of 4½ by 1¼ in. stock, is suspended from the trolley axles between the wheels, passing down between the I beams, with the hoist cylinder attached to the lower end. This air cylinder has a 10 in. diameter and 60 in. stroke, with the control operated by a double chain attached to the air valve.

Under the central part of the crane, there is a standard gauge track leading in from the yard, and also a 20 in. narrow gauge service track intermediate to it, leading out from the shop, which is just back from and parallel with the crane runway. Wheels may be brought in over the yard track, or out from the shop over the service track, and be handled by the hoist. Under the tripod legs, there are on each side a pair of storage tracks, the pair on one side for receiving wheels from the road, and the other

these two blocks, there are four 3 by ½ in. bars, bent upward at the end, and secured to the end blocks. Under the central portion of the car, they are on edge, with separating blocks between. The floor, or top of these bars, is 6 ins. above rail level.



Boring Mill Tool for Turning Surfaces That Cannot be Handled in the Lathe.

Boring Mill Tool for Turning Difficult Surfaces.

The tool shown in the accompanying illustration is used for turning difficult surfaces that cannot be handled in the lathe, in the boring mill. These difficult parts include such operations as the turning of grease cups on driving rods, turning the ends of rocker arms, and truing the ends of rocker shafts. It was designed for use on the horizontal boring mill.

The tool is made in two parts, as it was found that by so doing it could be made more easily and at a lesser cost. The shank is a solid taper plug, threaded on the outer end, with a driving tang on the other end.

from the shank once the work is trued up in order that the head might work up as far as possible over the member being machined.

When truing up the ends of tumbling shafts, the shaft is placed in V blocks on the table and centred with the ¾ in. pin in the tool, and a dead centre placed in the boring bar support. After it is firmly clamped, the centre pin is removed from the jig, and the bearings are then trued up. The tool is placed at an angle of 15 degrees, so that the point of the tool will be in advance of the end of the jig. The information in regard to this tool is taken from the Railway Age Gazette, Mechanical Edition.

Cab Storage at Grand Trunk Railway Montreal Shops.

As pointed out in the last issue of Canadian Railway and Marine World, in describing the locomotive tire storage system of the G.T.R. Montreal shops, it is most essential, if repair work is to be handled expeditiously and at low cost, that the parts in most frequent demand should be conveniently stored, where they may be got out quickly, as required. Certain standard parts of a locomotive may be made before the demand for their use arises, minimizing the time shopping to that extent when it becomes necessary to renew that part.

This applies to locomotive cabs, which are more or less standard on the different types of locomotives in use on the G.T.R. At the Montreal shops there are always on hand at least a dozen, which has been found to be a time saver when a locomotive comes in that requires only a cab renewal, all that

is required being the replacing of the old cab with a new one from stock.

To make the cabs convenient for ready application, a storage space has been set aside, which resembles closely the tire storage space at the same point, referred to above. The cab storage space is shown in the accompanying illustration. Three rows of old bridge columns support three runways, with two parallel craneways, the cranes on which are hand operated, wherein they differ from the tire storage space, where the crane is electrically operated, necessitated by the frequent use to which the yard is put. In the cab space the cabs are raised from the ground on low frames, and are ranged side by side, to be conveniently got at. The same storage space is used for the stock of pilots, which are always kept in store for quick repairs.

Removing Centre Sills at Canadian Pacific Ry. West Toronto Car Shops.

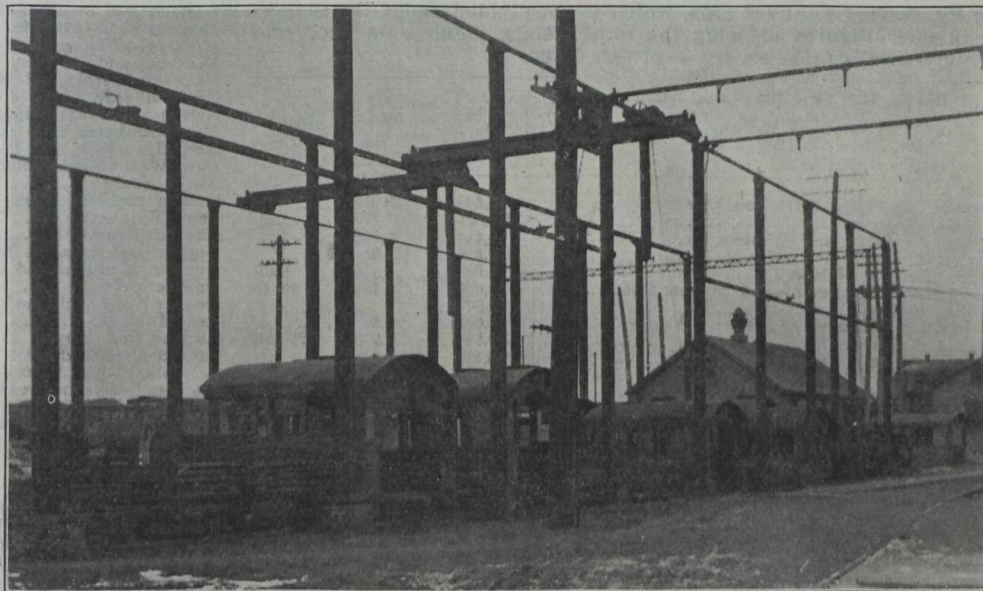
The C. P. R.'s general policy about wooden freight car repairs has been, when a car comes into the shops requiring a new centre sill, to replace the damaged centre sill by the new C. P. R. steel centre sill, which can be applied to wooden equipment with practically no change in the car design, the steel sill slipping into place in the position formerly occupied by the wooden sill, the connecting members all fitting to the new steel sill with but little adjustment.

In the removal of the old wooden sills, whether for replacement with wooden or steel sills, the West Toronto shops have in use a type of air jack, manufactured on the premises, which does excellent work, not only in the speed with which it is executed, but also from the manner in which it does it without damage to the body of the car. The usual procedure is to first of all remove the draft gear, needle beams, truss rods, and any other members that are attached to the sills. Then, with considerable effort, resulting in the removal of a good portion of the floor, the nails from the floor into the sills are removed, when, with some prying, the sills can be dropped to the

air jack shown consists of an old locomotive air cylinder, mounted on wheels, with air connection pipes and valves attached to the handle of its truck. This air jack truck is run in under the I beam member, directly below the sill to be removed. A small hole is cut in the floor directly over the sill, over which a chain is passed from the hook on the end of the air cylinder plunger rod, when the latter is in its uppermost position. Turning on the air causes the plunger to descend, pulling the cylinder up against the I beam member, and bodily

in the illustration, and the trucks removed from underneath, the trucks being run under the crane. While the old sill is being removed, a new steel sill is being applied to the two trucks, the combined trucks and sill on completion being run back under the jacked up car. The crane is used for fitting the sill on the trucks, lifting the sill from the storage pile to the truck.

Pile Driver on Intercolonial Work.—What is said to be the largest pile driver ever built has been used in driving the large con-



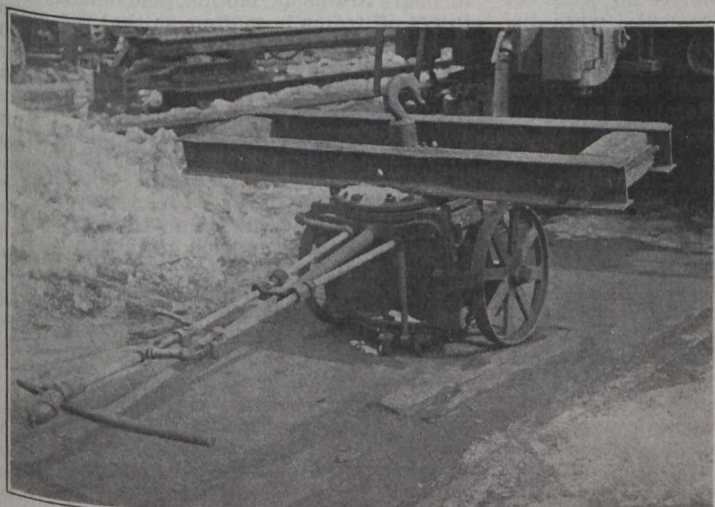
Crane Served Storage Space for Cabs and Pilots.

drawing the sill away from the nails and other minor holding obstructions in the car floor. Moving the jack and I beam member along further under the centre of the car, the operation is repeated, this second pull completely loosening the sill, which may then be drawn out from under the car on the air jack truck, from the end of the car. The operation is very quickly performed.

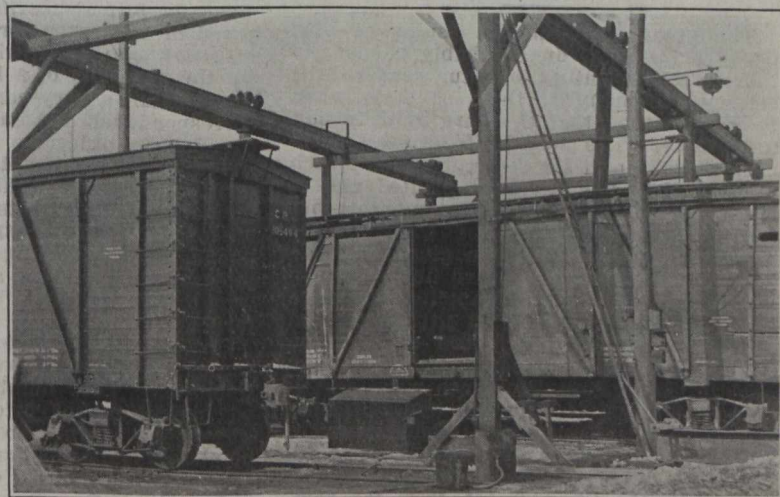
For the replacement of steel sills for the

crete piles in the I.R.C.'s ocean terminal at Halifax, N.S. The combined weight of the hammer with follower is stated to be 24,000 lbs.; weight of ram only, 4,000 lbs.; diameter and stroke of cylinder, 14 by 36 ins. The hammer is said to have driven 1,800 reinforced concrete piles, 24 ins. square, varying in length from 37 to 77 ft.

Electric furnaces for the ordinary



Air Jack for Removing Damaged Wooden Centre Sills.



Crane for Handling Centre Sill Repairs.

ground from under the jacked up car. The sills are then taken out from under the car.

With the use of the device herewith illustrated, this procedure is somewhat altered. The car is jacked up as usual on trestles, the trucks removed, and all attached parts loosened from the sills. Then, under one end of the sills, the double I beam member is placed, blocked on its ends from the under side of the side sills, and held up under this blocking by chains. The

wooden ones, the yard crane arrangement shown herewith was built at the West Toronto shops, and is used in conjunction with the jack. The crane consists of runway tracks at right angles to the yard tracks, and covering four tracks. The overhead crane carries air plunger hoists. Alongside the tracks, the steel sills, as received complete from Montreal, are unloaded ready for use. The car to have the sill replaced is jacked up to the right of the crane position.

steel foundry are now being regularly built and are claimed to give good results, electric melting having many advantages from a metallurgical standpoint. The new electric furnaces are made as nearly automatic in action as possible and many improvements in their design have been introduced during the last few years, so that it is claimed to be easier at present to get good results from an electric furnace than from the ordinary type.

Steam Railway Freight Statistics.

The aggregate tonnage of freight carried by Canadian railways during the year ended June 30, 1913, was 106,992,710 tons, against 89,444,331 in the previous year, and 79,884,282 tons for the year ended June 30, 1911. Of the total tonnage carried during the last statistical year, 56,829,297 tons originated on home lines, 21,284,742 were received from other lines in Canada, and 27,317,214 were received from U.S. railways. This is the first year in which the tonnage received from other lines has been divided so as to show that received by Canadian lines from U.S. lines. The totals of the three columns in the following table do not aggregate 106,992,710 tons, the difference being caused by the fact that the G.T. Pacific Ry. carried 1,561,457 tons, which is not divided under the several headings. Figures showing the total freight tonnage on each line are given in a table on pg. — of this issue.

Name of Railway.	Originating on own line.	Received from other lines in Canada.	Received from U. S. Lines
Algoma Central and Hudson Bay	365,588	29,949	
Algoma Eastern	613,891	770	
Atlantic, Quebec and Western	8,413	9,892	
Bay of Quinte	159,549	121,351	
Bedlington and Nelson	1,695		421
Brandon, Saskatchewan and Hudson Bay	58,055	151	19,097
British Yukon	61,964		
Brockville, Westport and North Western	15,047	26,507	
Canada Southern	940,824	377,908	7,269,305
Canadian Govt. Rys.—Intercolonial	3,516,430	1,800,031	
P. E. Island	113,070	9,644	
Canadian Northern	5,476,842	943,103	401,866
Ontario	735,497	278,613	
Quebec	608,721	310,297	124,513
Canadian Pacific	21,044,667	6,458,718	1,968,429
Cape Breton	1,967	3,442	
Caracquet	24,626	10,334	
Central Ontario	195,221	99,023	
Crow's Nest Southern	218,242	51,776	12,280
Canada and Gulf Terminal	16,728	4,031	
Cumberland	354,122	12,367	
Dominion Atlantic	296,409	71,488	
Eastern British Columbia	162,006	1,863	
Elgin and Havelock	9,140	3,038	
Essex Terminal	55,682	106,192	
Esquimalt and Nanaimo	376,899	101,671	
Grand Trunk	9,065,232	2,823,204	9,153,370
(Canada Atlantic)	970,276	907,395	51,193
Pacific (see below)			
Halifax and South Western	261,121	33,956	
Hereford	129,575	3,853	4,104
Inverness Ry. and Coal Co.	238,842	13,890	
Irondale, Bancroft and Ottawa	16,671	10,158	
International of New Brunswick	100,242	6,390	

Name of Railway.	Originating on own line.	Received from other lines in Canada.	Received from U. S. Lines
Kent Northern	5,835	5,706	
Kettle Valley	2,458	20	159
Kingston and Pembroke	41,589	41,871	5,400
Klondike Mines	44,400		
Lotbiniere and Megantic	49,407	2,440	65
London and Port Stanley	21,529	15,951	605,440
Maine Central			188,942
Manitoba Great Northern	42,329	4,254	52,232
Maritime Coal Ry. and Power Co.	204,291	4,776	
Massawippi Valley	159,573	420,495	153,967
Moncton and Buctouche	19,025	4,563	
Midland Ry. of Manitoba	3,715	68	223,519
Montreal and Atlantic	108,404	770,014	491,044
Montreal and Province Line	20,436	74,888	4,688
Montreal and Vermont Jct.	14,889	276,907	98,808
Morrisey, Fernie and Michel	830,405	21,353	
Napierville Jct.	10,351	94,810	305,568
Nelson and Fort Sheppard	18,387	447	12,278
New Brunswick Coal and Ry. Co.	62,433	5,887	
New Brunswick and P. E. Island	39,366	10,427	
New Westminster Southern	34,116	29,187	
North Shore	3,930		
Ottawa and New York	66,974	75,189	181,000
Pere Marquette	58,692	228,868	2,594,337
Quebec Central	930,999	174,012	
Quebec and Lake St. John	395,929	144,422	
Quebec, Montreal and Southern	89,618	333,621	39,179
Quebec Oriental	16,307	25,767	
Quebec Ry., Light and Power Co.	180,406	12,669	
Red Mountain	1,885	43	20,884
Rutland and Noyan	167	316,857	19,865
Salisbury and Albert	41,553	5,986	
Schomberg and Aurora	7,180	3,683	
Stanstead, Shefford and Chambly	14,326	300,117	100,069
St. Clair Tunnel			792,689
St. Lawrence and Adirondack	32,735	220,847	
St. Martin's	8,343	4,115	
Sydney and Louisburg	4,732,016	179,037	
Temiscouata	173,696	13,857	
Thousand Islands	421,071	229,176	
Timiskaming and Northern Ontario	20,295	25,475	
Toronto, Hamilton and Buffalo	296,239	2,491,789	
Vancouver, Victoria and Eastern	999,768	11,275	436,746
Victoria Terminal Ry. and Ferry Co.	10,073	33,659	
Victoria and Sidney, B.C.	21,161	24,121	
Wabash (in Canada)	23,841	9,419	1,985,767
Wellington Colliery	274,180	4,362	
York and Carleton	11,691	1,327	
Final total	56,829,297	21,284,742	27,317,214
Originating on own lines	56,829,297		tons
Received from other Canadian lines		21,284,742	"
Received from U.S. lines			27,317,214 "
G.T.P.R. not distributed			1,561,457 "
			106,992,710 tons

The Board of Railway Commissioners Report.

The great delay in the issuing of blue books at Ottawa, due probably to congestion in the printing bureau, renders the contents of many of them so stale when they are issued that they are of little current value. The Board of Railway Commissioners' report for the year ended March 31, 1913, has not yet been printed and is not expected to be for some months, but the following summary of some of its principal contents has been given out:—

During the year the Board held 102 public sittings, at which 698 applications were heard, as compared with 89 sittings for the previous year at which 695 applications were heard. The number of public sittings held in the various Provinces were as follows:—Ontario, 64; Quebec and Maritime Provinces, 13; Manitoba, 6; Saskatchewan, 7; Alberta, 6; British Columbia, 8. The applications heard included a variety of matters under the Railway Act, from the complaint of a private individual to matters of more general public interest affecting the community at large, such as express rates, railway company's tariffs, telephone rates, telegraph tolls, and matters pertaining to the operation of railways generally. The number of general orders issued was seven, and the number of general circulars issued to all railways subject to the Board's jurisdiction was 14. The total number of orders issued was 2,785, a slight decrease from the preceding year. In addition to the matters heard at formal sittings there were a large

number of informal matters dealt with. Of a total of 5,751 applications and complaints dealt with by the Board, only 8.2% were set down for formal hearing and 91.8 were disposed of without a formal hearing. These informal complaints, which are settled without the necessity of a formal hearing, often times entail a very considerable amount of correspondence and enquiry on the part of the Board's officers.

Traffic Department.—The number of tariffs received and filed were as follows, including supplements: Freight, 49,200; passenger, 6,774; express, 17,994; telephone, 2,051; sleeping and parlor car, 22; telegraph, 17; making a total of 76,058, or a grand total to Mar. 31, 1913, of \$394,989 tariffs.

Engineering Department.—A large number of inspections were made covering the Dominion. They numbered 316 and included inspections of bridges, subways, highways and farm crossings, interlocking plants, opening of lines for traffic, culverts, fences, cattle guards, etc.

Operating Department.—In this department is included the investigation of accidents, car service, condition of rolling stock, etc. The total number of killed and injured, reported by the various railway companies for the year was 2,547, of which 643 persons were killed and 2,231 injured. Of the total of 643 persons killed 250, or approximately 39% of the total, were trespassers on railway tracks. Twenty-one passengers were killed, or 3.26% of the total. Of this total of 21 passengers killed it appears that 15 met death by what would appear to be preventable causes on the part

of the passengers themselves, such as falling off trains while in motion, endeavoring to board trains in motion, and endeavoring to get off trains in motion, so that the actual number of passengers killed in what might be termed preventable causes on the part of the railway companies, was only 6, or less than 1% of the total number of 643 persons killed. The railway employes killed numbered 303, or 47% of the total. Of the total injured 410, or 17.9%, were passengers, and of this number 75, or 18.3%, were injured from preventable causes on the part of the passengers injured, such as attempting to get off and on trains in motion. Of the total of persons injured 1,603, or 71.8%, were employes of the railway companies. It will be noted that of what may be termed the preventable loss, 250 killed fall under the heading of trespassers, which is a very large percentage of the total killed, and in this connection the Board has taken up with the attorney general of the various Provinces, the question of prosecuting trespassers on railway property, with a view to limiting the large number of fatalities which occur in this way. The following table shows the totals by Provinces as regards trespassers killed and injured:—

	Killed.	Injured.
Ontario	132	62
Quebec	35	21
Alberta	19	7
Saskatchewan	14	10
British Columbia	31	7
Manitoba	14	6
New Brunswick	4	1
Nova Scotia	1	—
Yukon	1	—
Total	250	116

Fire Inspection Department.—The organ-

ization of this Department was proceeded with immediately following the issuance of order 16,570, May 20, 1912, which deals with the question of fire protection generally, throughout the Dominion. During the season of 1913 200 fires were reported as started within 200 ft. of railway tracks and the classification of the causes of the fires shows that 164 are credited to trains, and the balance of 36 are ascribed to tramps, camp fires and unknown causes. The acreage burned over by the fires outside of the right of way of cultivated land, 4,135 acres, of young forest growth, 17,017 acres, of timber land, 1,322 acres, and of slash or old burn, not restocking, 2,674, making in all a total of 25,148 acres visited by fire. The total value of the property destroyed by fire, as reported, is estimated at \$88,480. These figures relate only to lands adjacent to railway lines subject to the Board's jurisdiction.

Birthdays of Transportation Men in May.

Many happy returns of the day to:—

- Jas. Bain, General Superintendent, Halifax and South Western Ry., Bridgewater, N. S., born at Pictou, N. S., May 24, 1860.
 W. R. Baker, Secretary, and Assistant to President, C.P.R., Montreal, born at York, Eng., May 25, 1852.
 G. S. Cantlie, General Superintendent Car Service, C.P.R., Montreal, born there May 2, 1867.
 M. Donaldson, M. Can. Soc. C.E., Vice President and General Manager, Grand Trunk Pacific Ry., Winnipeg, born near Edinburgh, Scotland, May 1, 1851.
 A. E. Duff, ex-District Passenger Agent, G.T.R., Toronto, now of Winnipeg, born at Sherbrooke, Que., May 1, 1872.
 G. C. Dunn, District Engineer, G.T.P.R., Winnipeg, born at Quebec, May 13, 1862.
 G. I. Evans, Superintendent, Angus Locomotive Shops, C.P.R., Montreal, born there, May, 1880.
 M. A. Fullington, A.M. Can. Soc. C.E., Assistant Superintendent, District 4, Eastern Division, C.P.R., Ottawa, born at Johnson, Vt., May 12, 1880.
 D. J. Hackett, Superintendent, Canada Division, Michigan Central Rd., St. Thomas, Ont., born in Cass County, Mich., May 1, 1868.
 G. H. Hedge, Master Mechanic, Central Division, Canadian Northern Ry., Winnipeg, born at Neath, Wales, May 26, 1865.
 T. Henry, Operating Superintendent, Passenger Steamers, Canada Steamship Lines Ltd., Montreal, born there, May 29, 1865.
 G. A. Hoag, Superintendent, Central Ontario Ry., Trenton, Ont., born at Walter's Falls, Ont., May 31, 1866.
 W. T. Huggan, Division Accountant and District Passenger Agent, Prince Edward Island Ry., Charlottetown, P.E.I., born at Halifax, N.S., May 24, 1851.
 J. Irwin, Superintendent, District 3, Canadian Northern Ry., Dauphin, Man., born at Clinton, Ont., May 28, 1866.
 A. C. Shaw, General Passenger Agent, Western Lines, C.P.R., Winnipeg, born at Detroit, Mich., May 12, 1865.
 H. B. Sherwood, Superintendent, Bay of Quinte Ry., Napanee, Ont., born at Auburn, N. Y., May 25, 1847.
 W. Stapleton, District Passenger Agent, Canadian Northern Ry., Saskatoon, Sask., born at Bristol, Eng., May 20, 1884.
 E. Tiffin, General Western Agent, Canadian Government Railways, Toronto, born at Hamilton, Ont., May 5, 1849.
 J. H. Walsh, General Manager, Quebec Central Ry., Sherbrooke, Que., born at Quebec, May 12, 1860.

H. K. Wicksteed, B.A.Sc., M. Can. Soc. C. E., Chief Engineer of Surveys, Mackenzie, Mann & Co, Ltd., Toronto, born at Quebec, May 25, 1855.

James Yeo, ex-Roadmaster, Intercolonial Ry., Riviere du Loup, Que., born at Bideford, Devonshire, Eng., May 1, 1830.

The Grand Trunk Pacific Hotel at Regina.

Building operations have been commenced at Regina, Sask., by the G. T. P. R. on the Hotel Qu'Appelle. The site selected is Wascana Park at the corner of Sixteenth Ave. and Albert St., two sides facing these thoroughfares and the other elevation overlooking the park and commanding a view of the Legislative Buildings. The building will be set back from the street line suf-

approaches, will be the office. Adjoining the rotunda will be the telephone and cigar stands. The palm room and main dining room will overlook the park, and doors from the palm room will open on to a terrace from which steps will lead down to the park. The main dining room, palm room and rotunda will extend through the height of two stories, the main floor and the mezzanine. The mezzanine will provide a musicians' gallery for the dining room, a gallery overlooking the rotunda, and a spectators' view of the dining room. It will also provide a private dining room, and a small banquet room and manager's office. Immediately upon entering and before ascending the few steps to the main floor, approach may be made to the grill room and bar by stairs leading left and right from this entrance landing. Above the



Grand Trunk Pacific Ry. Hotel Qu'Appelle, Regina, Sask.

ficiently to give it a setting and relationship to the surrounding landscape that will take advantage of the situation to the fullest extent. Architecturally, like the other hotels on the system, it will be of the chateau type.

Immediately opposite the hotel, the station will be erected, providing convenient and immediate communication with the hotel. The station building will also include the power house from which light, heat and power service will be transmitted to the hotel through a service tunnel under the streets.

The main entrance of the hotel will be placed in the centre of the Albert St. elevation. A few steps will lead from the entrance to the concourse or rotunda and immediately opposite this entrance, commanding also the ladies' entrance, the elevator, stair, palm room and dining room

main floor and the mezzanine, there will be seven floors for guests' bedrooms. All rooms facing Wascana Park and the streets, will have outside private bathrooms, all rooms to the main court will have running water, and on every floor will be provided ample lavatory accommodation. There will be a total of 224 bedrooms, almost all of which can be used as double rooms on account of their large dimensions. The grill room, bar, barber shop, general toilet, main service and kitchen will be in the basement, and the laundry, stores, locker rooms, elevator machinery and refrigerator equipment in the subbasement.

In construction the exterior will be of grey brick with stone dressings and finish, the interior will be of steel frame and reinforced concrete. The typical floors of guests' rooms will be finished with hardwood doors and enamelled white trim.

Book Reviews.

Any of the books reviewed may be obtained through Canadian Railway and Marine World at the published price.

PROCEEDINGS OF NATIONAL ASSOCIATION of Railway Commissioners, Annual Meeting at Washington, 113. 612 pages, 9 by 6 ins., cloth, Law Reporting Co., 115 Broadway, New York, N.Y.

This includes all committee reports and the discussion thereon.

GREAT LAKES REGISTER. 450 pages, 8¼ by 12 ins., leather. Great Lakes Register, Rockefeller Bldg., Cleveland, Ohio, \$25 a year, including supplements, by subscription.

This register, which is issued under the control of, and has been adopted by, the Lake Underwriters, as their official classification register, on which they base all rates of insurance for both hulls and cargoes, contains a full and up to date list of all steam and sailing vessels of any importance, sailing on the Great Lakes, and owned in Canada and the United States. These are arranged in a convenient manner for ready reference, and give full data of both hulls and machinery, with complete lists of owners, their addresses, and the vessels controlled by each. There are also lists of vessels, the names of which have been changed, of shipbuilders with the names, gross tonnage and date of building all vessels built by them; and also of dry docks, floating dry docks and marine railways, with their capacity and location. The information contained in the register cannot be found in any other publication, and is without doubt of great service to all interested in the lake marine.

OUTLINES OF RAILWAY ECONOMICS.—

By Douglas Knoop, M.A., Lecturer on Economics in the University of Sheffield, Eng. 274 pages, 8 by 5 in. Cloth boards. Macmillan Co. of Canada: Toronto. \$1.25 net.

AMERICAN RAILROAD ECONOMICS.—By A. M. Sakolski, Ph.D., Staff Lecturer in New York University School of Commerce, Accounts and Finance. 296 pages, 8 by 5 in. Cloth boards. Macmillan Co. of Canada: Toronto. \$1.25 net.

These two books treat at considerable length upon the important and interesting question of railway economics. They are independent studies of the question, the first on the general subject by a British author, and the second, an analysis of the practical working of United States railways, and an attempt to lay before investors and students, such information as may assist them in forming a correct judgment of railway activities and operating results. Although written by men having different viewpoints the two books may be profitably read together.

Mr. Knoop, in the "Outlines of Railway Economics," devotes his first chapter to considering the subject matter of economics, the definition and methods of economical science, and then applies these methods to railways. In the following nineteen chapters he discusses at length all the various features and laws governing production, markets, increasing and decreasing returns, applying them specifically to railways, and illustrating his course of reasoning from the experience of British railways. The book includes a good deal of matter which would ordinarily be excluded from a work on railways, but its inclusion has the advantage of emphasizing the connection between general economics and railway economics, a connection which is too often ignored in the popular discussion of questions affecting railways. The final chapter deals with

the state ownership and management of railways.

The second book, "American Railroad Economics," sets out to discuss data relating to the character of the transportation facilities; data measuring efficiency and economy of operation; data measuring revenues, expenses and net earnings, and data measuring the capital investment in relation to the corporate resources and liabilities. In other words, the author finds his material in the statistical reports issued by the railways to their shareholders and filed with the Interstate Commerce Commission. He then proceeds to show that while these tables give a vast amount of valuable information, prepared "by professional analysts and railroad statisticians" who aim "to gauge railway activities by the use of rigid standards and definite mathematical formulae," they do not form an accurate standard by which to measure one railway against another, and do not show the relative values of the capital stock as an investment. The twelve chapters into which the work is divided discuss the various data mentioned in detail, and, without laying down any definite plans by which a correct judgment in these matters can be reached, such information is given as will enable any one interested to work out plans for himself. One of the principal causes of the defects in the use of railway statistics, he points out, is the misunderstanding of the real significance of each statistical item. Lack of appreciation of the intrinsic worth of the figures presented leads to erroneous analyses and improper comparisons. Unless a statistical analysis is of some distinct value to the railway executive or manager, to the investor, or to the statesman, or to the public at large, it cannot be justified economically. In other words, each class of railway data should have an underlying purpose, and should be compiled, classified and interpreted to accord with this purpose. Chap. 8, which deals with Interstate Commerce Commission's system of railway accounts, is especially worth study.

TEXT BOOK ON RAILROAD SURVEYING.—By G. W. Pickles, C.E., and C. C. Wiley, C.E., 263 pages, 4¼ x 6¾ inches. 66 figures, 14 tables, morocco. John Wiley & Sons, Inc., N.Y., \$2.50 net.

H. K. Wicksteed, B. A. Sc., M. Can. Soc. C.E., has favored us with the following: This is a little book written and compiled by two professors of Illinois University, and it bears the marks of its scholastic origin to a very large extent, but it is nevertheless one of the most satisfactory books of its kind ever published, and it is the first which considers the spiral curve in conjunction with the simple, and as an essential part of it, and it is the first we believe to be placed on the market which sets forth the true spiral as primarily a variation of the circle and to be run in the field in the same way by tangential angles, and that the relation of these angles one to another, and to the central angle, are almost as simple and easy to remember as those of the circular curve itself, although it is susceptible like the latter to being laid out when necessary under exceptional conditions by rectangular co-ordinates. A large portion of the book is given up to the discussion of this curve and its properties, and in the appendix is a demonstration of some of the theorems for those who have sufficient knowledge of the higher mathematics to follow it. The subject of overhaul in earthwork and its calculation by means of the "mass curve" or "curve of volumes" is pleasingly discussed and demonstrated, and a third departure from the older books of the same type is a short dissertation on the vertical curve which is now an essential

of all first class location. It is a pity, perhaps, that while the authors have been liberal in diagrams they have not illustrated this problem by one, but have contented themselves by merely working out one suppositious case of the very simplest nature in figures. We can easily imagine an assistant engineer with a very fair knowledge of geometry being puzzled to follow the demonstration and we think, too, that the method of co-ordinates as being especially adapted to drawings on profile or cross-section paper might have been brought to great advantage as an alternative and, in some cases, a simpler method. The tables given are good and well arranged and sufficient for all ordinary surveying operations, and withal the book is quite small and portable, nearly double the thickness might be carried about without inconvenience. Under these circumstances and when the up to dateness of most of the matter is so marked and satisfactory, one is led to wonder why a little more of that found in the older pocket books is not reintroduced so as to make the little manual complete in itself. Some of the devices for running curves past an obstacle, for instance, might well have been illustrated, and a few pages might have been devoted to astronomical determination of the meridian and of the latitude and to the adjustment of instruments, etc. One striking feature which is hardly modern is the amount of pains and space given to the calculation of the long chord of the curve and the ordinates from it, while no notice is taken of the "tangential" method of running in curves, which is becoming more and more general on Canadian roads as a time saver. Only three or four pages out of 120 are devoted to a discussion of questions of "economics" of location. What is said is good, and generally well said, but it would seem a pity that a few general data should not have been given to enable a locating engineer to estimate even roughly the value of reducing or eliminating a grade or a series of curves. To sum up the criticism in a few words, it may be said that so much is better put than it has ever been put before, and so much is new in form at least, that we should like to see the scope of the book expanded so as to include the best of what has been said before and to cover so far as a pocket book may the subject of which it treats.

Lackawanna Passenger Terminal at Buffalo.—Ground has been broken for the new passenger terminal of the Delaware, Lackawanna & Western Rd. at Buffalo, N.Y. The station will be across Main St. from the present one, between Ohio St. and Buffalo River. In order to give the necessary width, Ohio St. will be moved north for several blocks, half its width most of the way, but about 120 ft. at Main St. There will be six elevated stub tracks, covered by a trainshed. These tracks will terminate at the east line of Washington St., the space between there and Main St. being occupied by the head house. A seventh elevated track will pass the station on the north and reach the docks beyond the present station. There will also be a track across Main St. at grade to accommodate the freight house. Underneath the new station will be a warehouse; this will be served by one track at the low level, the design ultimately allowing for three tracks. More than 1,000 ft. of the station layout will bear directly on the bulkhead wall along the river. Except in two or three places where complications will require special piers, this wall, which will be mass concrete, will be carried on piles.

About 135,000,000 railway ties are used each year in the United States.

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta and Great Waterways Ry.—It was expected to have the right of way from the junction with the Edmonton, Dunvegan and British Columbia Ry. to Lac la Biche, Alta., cleared by April 30. Grading is to be pushed as fast as possible, and track is expected to be laid to Lac la Biche by the end of the year. J. D. McArthur, Winnipeg, is the contractor, and W. R. Smith, Edmonton, Alta., is Chief Engineer.

The route map for the first 125 miles of the line shows that it will run almost entirely through an agricultural country. The line starts from the Edmonton, Dunvegan and British Columbia Ry. about two miles north of the Sturgeon River, and passes through or near Excelsior, Bon Accord, Battenburg, Fedorah, Staybridge and Egremont, on to tp. 26, range 24, about six miles south of Flat Lake, and then on to the south of Big Egg Lake. (April, pg. 165.)

Bruce Peninsula Ry.—In passing through the House of Commons the bill to incorporate this company was amended by striking out the section giving authority to develop and transmit electric power. (April, pg. 165.)

Burrard Inlet Tunnel and Bridge Co.—The Dominion Parliament has extended the time for the construction of the proposed bridge, tunnel and railway at the second narrows of Burrard Inlet, Vancouver, B.C.

Tenders were opened April 1, for the construction of the proposed bridge. Contractors were asked to submit prices for substructure and superstructure separately, on the plans prepared by Sir J. W. Barry, Consulting Engineer, London, Eng., and approved by the Dominion Government. The tenders were:—Missouri Valley Bridge Co., Kansas City, Mo., substructure, \$923,484. Armstrong and Morrison, Vancouver, substructure, \$1,376,173. Dominion Bridge Co., Montreal, superstructure, \$1,453,047. Canadian Bridge Co., Walkerville, Ont., superstructure, \$1,519,615. Sir William Arroll, Glasgow, Scotland, per Armstrong and Morrison, superstructure, \$1,626,635. Cleveland Bridge and Engineering Co., Darlington, Eng., superstructure, \$2,122,062. Alternative plans and tenders were submitted as follows:—Armstrong and Morrison and the Dominion Bridge Co., substructure, \$1,110,656; superstructure, \$1,177,135. Armstrong and Morrison and Dominion Bridge Co., substructure, \$1,080,700; superstructure, \$1,097,544. Western Foundations Co., Toronto, substructure, \$825,997; superstructure, \$904,169. Metropolitan Tunnel and Public Works Co., London, Eng., superstructure, \$2,276,300. (Mar., pg. 121.)

Calgary and Fernie Ry.—Vancouver, B.C., press reports state that five engineering parties have been placed in the field to locate this projected line from Calgary, Alta., into the Crownst Pass coalfield. The parties are said to total 80 men, and to be working under the general direction of Du Cane, Dutcher & Co., Vancouver. Mr. Du Cane is a son-in-law of one of the partners in Childs Bank, London, Eng., and has recently been over the route along with A. H. Barry, an English engineer associated with Sir John Wolfe-Barry, who designed the projected bridge across the second narrows of Burrard Inlet. It is stated that surveys have reached such a stage that Government approval will be asked for the plans, and a contract let for construction at an early date.

The Dominion Parliament has extended the time for construction; changed the head office from Fernie, B.C., to Calgary, Alta.;

and increased the bonding powers from \$20,000 to \$50,000 a mile. (April, pg. 165.)

Central Canada Ry.—Plans for this railway, to start from the Edmonton, Dunvegan and British Columbia Ry. at Round Lake, and proceed along the valley of the North Hart River to Peace River Crossing, Alta., have been filed with the Alberta Government. It is estimated that 50,000 yds. of earth per mile will have to be moved, and that many bridges will have to be built. On one section of 18 miles the plans show that 60 steel bridges of from 75 to 125 ft. spans will be required. In the last 18 miles to Peace River Crossing the line will drop 700 ft. A steel bridge will have to be built at Peace River Crossing at an estimated cost of \$400,000. Surveys along the north bank of the Upper Peace River to Dunvegan are being made. J. D. McArthur, Winnipeg, who is also associated with the Edmonton, Dunvegan and British Columbia Ry. and the Alberta and Great Waterways Ry., is one of the provisional directors. (Mar., pg. 121.)

Central Western Canada Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from Winnipeg in a generally northwesterly direction, via Yorkton, Saskatoon and Battleford to Edmonton, Alta. (Mar., pg. 121.)

Chicago, Milwaukee and St. Paul Ry.—Chicago, Milwaukee and Puget Sound Ry.—F. Williams, the former company's right of way agent, has been in the district south of Vancouver recently, and press reports state that he has secured a right of way south of the International Boundary, which will link up the company's lines with the British Columbia Electric Ry. near Sumas. The company's engineers are reported to be making surveys for an independent line from near Sumas to Vancouver. It is stated that construction on the line to Sumas will be started this year. (Mar., pg. 121.)

Cornwall and Hawkesbury Ry.—Application is being made to the Dominion Parliament to incorporate a company with this title to build a railway from Cornwall, via Martintown, Alexandria, to Hawkesbury, Ont., thence to a connection with the C.P.R. at Grenville or Calumet, Que., about 50 miles. Pringle, Thompson, Burgess and Cote, Ottawa, solicitors for applicants.

Dominion Atlantic Ry.—The Dominion Parliament has extended the time within which the company may build the line from between Kentville and Canning, on its Cornwallis Branch, to the main line between Berwick and Middleton, N.S. (Feb., pg. 69.)

Edmonton, Dunvegan and British Columbia Ry.—Track laying has been completed beyond Sawridge, Alta., at the southeastern end of Lesser Slave Lake, and a freight service has been placed in operation from Edmonton. Progress is being made with the erection of a bridge across the Athabasca River at Smith, five miles beyond Sawridge. Eighty-five per cent. of the substructure has been completed, and a large quantity of steel for the superstructure has been delivered on the site. The station and other buildings at Smith are reported to be nearing completion. Considerable grading has been done beyond Smith, and it is expected that track will be laid as far as Big Smoky River by Dec. 31. W. R. Smith, Edmonton, Alta., is Chief Engineer. (April, pg. 165.)

Esquimalt and Nanaimo Ry.—The Dominion Parliament has granted an extension

of time for the completion of the following lines:—From Comox to Campbell River, B. C.; any branches to the east coast of Vancouver Island authorized in general terms by sec. 9, chap. 14 of the statutes of British Columbia, 1884; a branch from Comox southwesterly to the Alberni Canal; a line from Oyster Bay to Hardy Bay.

It is expected to complete the extension of the line from McBride Jct. to Comox, 44 miles, by July 1. Track had been laid to Sable River, Mar. 27, when R. Marpole, Vice President, made a trip of inspection over the line, and the other work through to Comox was found to be well advanced.

On the line to Nanaimo, considerable ballasting is being done near Table River, where a new steel bridge is to be erected. The Canadian Bridge Co. is getting in the necessary materials. (Dec., 1913, pg. 573.)

Glengarry and Stormont Ry.—The Board of Railway Commissioners has approved several deviations from the original plans for this line from a connection with the C. P.R. at St. Polycarpe, Que., to mileage 4.96; and from mileage 15.05 to Cornwall, Ont., mileage 27. (Feb., pg. 69.)

A press report April 22 stated that contracts have been let for the construction of this line as follows: G. R. Phillips, from north of the G. T. R. tracks, near Cornwall Station, to Glen Donald, 4 miles; the company proposes to build the next section itself; McDonald and Grant, from near Williamstown for 4 miles; A. C. Mulhern, next section easterly; A. C. McArthur, from C. P. R. at St. Polycarpe, Que., westerly to connect with the Mulhern contract. It is stated that the contracts call for the rapid completion of the work, and that it is hoped to have track laid by Nov. 1.

Intercolonial Ry.—The acting Minister of Railways stated in the House of Commons, April 1, that an engineering staff in charge of H. S. Clark is making surveys on the line near Dorchester and Sackville, N.B., with a view of securing improved gradients and curvature, and for the laying of a second track.

We are officially advised that the surveys being made on the line between Point Tupper and Sydney are simply the continuation of the grade revision surveys which were started in 1913. Several parties of engineers are in the field in connection with this work.

The Dominion Parliament has voted the following amounts for betterments:—

Amherst, additional facilities	\$2,666.67
Aston Jct., interlocking tower	1,666.67
Chatham, diversion of line, etc.	1,666.67
Chaudiere Jct. to St. Romuald second track	26,666.67
Nelson to Derby Jct. diversion	18,000.00
North Sydney-Leitch Creek diversion	26,666.66
Fredericton, increased accommodation	1,666.67
Halifax, docks and wharves	26,666.67
Halifax, new terminal facilities	416,666.66
Halifax, increased accommodation	3,583.33
Halifax, Willow Park yard service	2,500.00
Hampton, subway, etc.	6,666.66
Moncton, level crossing elimination	16,666.66
Moncton, new roofing	4,166.66
Mulgrave, new car ferry and dock	76,333.33
Point Tupper, improvements	5,000.00
Pugwash, spur line	4,666.66
Riviere du Loup, additional facilities	12,933.24
St. Flavie, increased accommodation	3,166.67
St. John, spur line	22,333.33
St. John, increased accommodation	550.00
Sussex, improvements	4,666.67
Sydney Mines, diversion	4,166.67
Truro, increased accommodation	16,666.66
New railway, Halifax to Dean's Settlement, further on account	141,666.67
Original construction	133.34
Increased water supply	4,500.00
Increased facilities generally	33,333.33
Surveys and inspections	8,333.34
Equipment of car shops, Moncton	6,000.00
Telephone operating system	10,666.66
Block system installation	16,666.67
Power plants, increase of	3,333.34
Protection of highways, general	5,500.00
Anti creepers and tie plates	5,333.34

Interprovincial Ry.—We are officially advised that the temporary officers and directors of the company are:—President, L. N. Asselin; Secretary, E. Letendre; Directors:—J. Theberge, L. Tache, A. Raymond, O. A. Talbot, all of Rimouski, Que. Provincial Securities, Limited, Quebec, of which R. Dupont, formerly with the Canada and Gulf Terminal Ry., is Managing Director, is interested in the project. A preliminary survey of the route from Rimouski, Que., to Edmundston, N.B., is being arranged for. (See Rimouski International Ry., April, pg. 166.)

Joliette and Lake Manuan Colonization Ry.—The Dominion Parliament has extended the time for the building of this projected railway from Joliette to the National Transcontinental Ry., and from Joliette to Montreal. (Jan., pg. 21.)

Kettle Valley Lines.—It is expected that track laying will be completed on the unfinished sections, between Midway and Penticton, by June 30. Satisfactory progress is being made with construction on the line west of Penticton, and it is expected to have Penticton and Spence's Bridge linked up by the end of the year.

Construction has been started on the section of the line from Osprey Lake to Princeton, 32 miles, the deviation into the latter place having been authorized last session by the British Columbia Legislature. We are officially advised that the contract for this section has been let to Guthrie, McDougall & Co. The contract calls for the completion of the work by Oct. 1. This is the last section of the entire line from Midway to Hope to be put under construction. When constructed, with the joint section arranged with the Vancouver, Victoria and Eastern Ry. from Princeton to near Otter Creek, it will give a through line between the points named, with a branch from Coldwater Jct., to Merritt, 25 miles.

The section from the Couihalla Summit, near Otter Creek, to Hope, will be operated jointly with the V. V. and E. Ry., under an agreement. About 25% of the grading on this section is reported to have been completed.

At Hope a bridge over the Fraser River is under construction to give connection with the C.P.R. It was reported April 10, that two of the piers for the substructure have been completed, and the construction of the other piers and abutments is well advanced. The Canadian Bridge Co. is assembling the material for the superstructure.

We are officially advised that it is expected to have steel laid on the uncompleted portions of the entire line from Midway to Hope, by Dec. 31. (April, pg. 165.)

Lake Erie and Northern Ry.—An act has been passed by the Dominion Parliament enabling the company to increase its bonding power from \$30,000 to \$45,000 a mile, and to issue other securities for the purpose of developing properties along its line, but these extended powers are not to be used until every municipality which has aided the company, has been released from its agreement.

Track laying was reported to have reached Brantford, from Galt, Ont., April 9, and ballasting has been started, a train working each way from the pit at Paris.

Construction is being proceeded with on the Brantford-Port Dover section, and it is expected that track laying will be started in both directions from Simcoe, as soon as work on the Brantford-Galt section is completed. The line is not expected to be ready for operation until the end of the year. (April, pg. 166.)

London, Grand Bend and Stratford Ry.—

The Ontario Legislature has incorporated a company with this title to build a railway to be operated by electricity or any other motive power, from London to Lake Huron at the boundary between Lambton and Huron counties, thence to Stratford and London, Ont., with branches as may be deemed necessary. The company is given authority to generate electrical power and to distribute the surplus in the municipalities along its route. The authorized capital is \$2,000,000 with a bonding power of \$35,000 a mile of line. The provisional directors are:—W. R. Willard, G. H. Gray, J. J. Gray. (Dec., 1913, pg. 593.)

Miramichi Bay Shore Ry.—The New Brunswick Legislature has under consideration a bill to incorporate a company to build a railway to serve Newcastle, Chatham and other places on the shores of Miramichi Bay.

Moncton and Buctouche Ry.—The bridge at Scotch Settlement, which was wrecked recently, has been reconstructed, and the line beyond that point has been cleared. The train service has been restored. Negotiations are in progress with the Intercolonial Ry. management for permission to switch the company's trains on the I.R.C., near Humphrey's Mills, and run them to and from Moncton station, instead of to and from the M. and B. station on Harper St., Moncton. (See Moncton and Northumberland Strait Ry., Jan., pg. 21.)

Newfoundland Railway and Train-Ferry Syndicate.—An act has been passed by the Newfoundland Legislature incorporating a company with this title to build a railway from Rantem or from any other suitable point on Trinity Bay, across the Isthmus of Avalon to Little Southern Harbor, or any other suitable point on Placentia Bay, with the right to put in a train ferry slip at Burin, and to build a railway from Humbermouth on the Bay of Islands, to South West Arm, on Green Bay, with a branch line to White Bay. The Isthmus of Avalon line is to commence within three years, and the line to Green Bay within five years from the completion of the Isthmus of Avalon railway. The company is entitled to two square miles of land at each of the sea frontages of its several terminals, the price of the same to be fixed by arbitration; it is authorized to take material for construction purposes on Government land, when it cannot be obtained on the right of way granted. The company may operate a train ferry to connect the two sections of its line, and other train ferry services to Louisburg, N. S., and to Gaspé, Que., or to other suitable ports. H. C. Thompson, St. John's, Nfld., is solicitor for the syndicate, the names of the members of which have not been disclosed.

Norfolk and Elgin Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from Simcoe to Port Burwell, Ont., and to operate a car ferry across Lake Erie. (April, pg. 166.)

North Shore Power, Ry. and Navigation Co.—Application is being made to the Dominion Parliament for an act authorizing the company to carry on its business and undertaking without the limits of Canada, and to change its title to that of the Gulf Pulp and Paper Co. Christie, Greene and Hill, Ottawa, solicitors for company.

Ottawa and Ungava Ry.—An extension of time for the building of this projected railway, as authorized by chap. 102 of the statutes of 1909-10, and by chap. 94 of the statutes of 1912, has been granted by the Dominion Parliament. Power has also been given to build a branch line with various spur lines. (Dec., 1913, pg. 574.)

Pacific, Peace River and Athabasca Ry.—

The Dominion Parliament has incorporated a company with this title to build a railway from Naas River, on the Pacific Coast, to Prince Albert, Sask., by a route described in a former issue. (Mar., pg. 121.)

Pacific and Hudson Bay Ry.—The Board of Railway Commissioners has approved location plans for this projected railway from Bella Coola, easterly to Hagensborg, B.C., 10,000 miles. (Jan., pg. 22.)

Pacific Great Eastern Ry.—The first portion of the line, viz.: from Vancouver to Fort George, B. C., has been under construction for nearly two years, and two sections are in operation. The first is from North Vancouver to Dundarave, 4.5 miles, and the second is from Squamish, the new name given to Newport, to Cheakamus, 13 miles, which includes the seven miles of track laid by the old Howe Sound and Northern Ry. The recent decision of the British Columbia Legislature to extend the line from Fort George to the Peace River country and to have the extension ready to handle traffic through to the Alberta boundary in 1916, has apparently given a great impetus to construction. It has been announced that 10,000 men will be distributed along the line between Vancouver and Fort George. The construction is well advanced to Kelly Lake, 200 miles from Vancouver, and we are officially advised that contracts have been let for the line southerly from Fort George, to Kelly Lake, to H. E. Carleton & Co., 25 miles; A. E. Griffin & Co., 25 miles; and Burns, Jordan & Co., 50 miles. These contractors have just completed subcontracts on the G. T. Pacific Ry. west of Fort George, and it was reported, April 3, that their outfits were being transferred to the P. G. E. route. The points between which these contractors will work had not been decided at the date of our advice. The construction on the 280 miles between Kelly Lake and Fort George is reported to be light. The main points on the route with distances from Vancouver are:—Squamish, 43 miles; Pemberton Meadows, 100 miles; Lillooet, 163 miles; Clinton, 210 miles; Lac la Hache, 285 miles; Quesnel, 395 miles; Fort George, 480 miles.

In connection with the extension of the line from Fort George to the Peace River Valley, where a junction would be made with the Edmonton, Dunvegan and British Columbia Ry., preliminary surveys have been completed, and locating parties are going over the 330 miles of the route. The location for some miles out of Fort George has been settled, and it is expected that contracts for grading the first 100 miles will be let at once. The line will start at the confluence of the Salmon and Fraser rivers, following the first named to Summit Lake, thence along the Crooked River valley to Fort McLeod, and McLeod Lake, thence along the Missinchurka River through Pine Pass and along the Pine River to Hudson's Hope, following the Peace River to the Alberta boundary. The distance from Fort George to Pine River Pass is 142 miles, and from Fort George to the Alberta boundary, 330 miles.

In preparation for the construction of docks for ocean going vessels and railroad terminals at Squamish, which is the point in Howe Sound where the line leaves tide-water, the company is reclaiming a tract of land about a mile long. Foreshore rights along the waterfront were recently granted to the railway company by the Dominion Government, conditional on the expenditure by the company of \$2,000,000 in improving the harbor. The dredging and refilling to be carried out this year at Squamish are to cost about \$200,000. (April, pg. 166.)

Peace River Ry.—The Dominion Parliament is being asked to incorporate a com-

pany with this title to build a railway from Grand Prairie to Fort Vermillion, Alta. Griesbach, O'Connor & Co., Ottawa, solicitors for applicants.

Prince Albert to Upper Beaver River.—Press reports from Prince Albert, Sask., state that a preliminary survey has been made by R. T. Gough for a railway from Prince Albert to the Upper Beaver River and thence to the provincial boundary, about 250 miles.

Prince Edward Island Ry.—The Dominion Parliament has voted the following sums for work on this line:—Original construction, \$166.67; to increase accommodation and facilities, \$866.66; on account of car ferries, terminals and connections, \$250,000. (Feb., pg. 70.)

Quinze and Blanche River Ry.—The Dominion Parliament has extended the time for the building of the line as provided in sec. 8, chap. 123, of the statutes of 1907. The company has power, subject to the consent of municipalities, to erect lines for the distribution of electric power which it may generate (Jan., pg. 22.)

Reid Newfoundland Co.—The Premier of Newfoundland was in London, Eng., recently for the purpose of raising a loan of \$2,000,000 to complete the government's railway plans. The agreement with the Reid Newfoundland Co. provided for the building of six branch lines, aggregating about 400 miles. Several of these have been completed, and the others are under construction. It is expected that in all 250 miles will be completed by Dec. 31, leaving 120 miles to be completed in 1915. The proceeds of the loan will be utilized to pay the government subsidy on the lines under construction. (Mar., pg. 122.)

Salmon Harbor Coal Co.—We are officially advised that the company has no railways constructed. There was formerly a spur line of about three miles, connecting the mines at Salmon Harbor, N. S., with the New Brunswick Coal and Ry. Co.'s line near Midland, but the rails were removed before the present company obtained possession of the property. The company has not reached any definite decision as to the reconstruction of this spur, or as to building any other line. The officers of the company are: Treasurer, G. Sargeant, New York; Treasurer, W. E. Conklin, New York; Secretary, W. F. Williams, New York; Manager, M. B. Davis, Salmon Harbor, N. S.

The St. Francis Valley Ry. Co. is the present title of a company incorporated by the Quebec Legislature under the title of the L'Avenir and Melbourne Ry., to build a line from Richmond or Melbourne to Drummondville, Que. We have been advised that this projected railway will start from near Drummondville, Que., and will follow the St. Francis River to Richmond, and thence continue south of Sherbrooke to the International Boundary line near Stanstead.

Press reports stated recently that in building the line the old C. P. R. line between L'Avenir and Melbourne will be used. We are advised that this piece of line was abandoned about 20 years ago. C. B. Hibbard, Montreal, is Vice President. (See L'Avenir and Melbourne Ry., Jan., 1913, pg. 83.)

St. John and Quebec Ry.—A bill is under consideration in the New Brunswick Legislature providing for the granting of further aid for the St. John Valley Ry., which is the portion of this proposed line being built in New Brunswick. The estimated cost of the three sections of the line under construction was stated by the Premier to be \$4,366,275. The total expended up to Nov. 30, 1913, was \$3,542,275, and it is estimated that \$757,080 more will be required to complete the work. The Province guaranteed the

company's securities to the amount of \$25,000 a mile, but the company was unable to find a market for the unguaranteed securities, and is therefore obliged to seek further assistance. The Government had the option of taking over the uncompleted line under section 5 of the contract and complete it as a public work, but it was decided, the Premier explained, in introducing the bill, April 8, that it would be more economical for the Legislature to give further assistance. The Government proposed that the Province guarantee a further issue of bonds to the amount of \$10,000 a mile, varying the amount of guarantee from \$8,000 a mile on the Centreville-Gagetown section, to larger amounts on the other sections, the whole not to exceed \$10,000 a mile on the whole line. \$1,500 a mile was reserved for the payment of interest, and it is proposed to increase this by the setting aside of \$1,000 a mile additional out of the new issue.

The Government has no intention of departing from the route of the line originally laid down, viz.; to provide a line from Grand Falls to St. John. It was suggested that the line from Gagetown be diverted so as to join the C. P. R. at Westfield. The Government, however, has no intention of so diverting it. The question of the bridge construction is an important one. It was anticipated that \$1,260,000 would have been sufficient to build the three bridges required, but it was a matter of surprise when the estimate of \$2,000,000 for the building of the bridge at Dunham's Wharf was submitted. However, a delegation waited on the Dominion Government and was assured that that Government will increase its undertaking to finance the building of these bridges up to \$3,000,000 and will meet the interest on that amount for 15 years.

An allegation was made in the House that the contractors for the railway had been compelled to pay large sums of money to members of the New Brunswick Government before they got their contracts, and it was asked that a committee be appointed to investigate the matter. (April, pg. 166.)

Thessalon and Northern Ry.—An extension of line has been granted by the Dominion Parliament for the building of the projected line from Thessalon Station, on the C. P. R. Algoma branch, to Thessalon town, and from Thessalon Station thence northerly to the Mississauga River in Gould tp. The section of the line into Thessalon has been built and is being operated by the C. P. R. (Nov., 1909, pg. 831.)

Timiskaming and Northern Ontario Ry.—We are officially advised that the plans for the electrification of branch lines are not yet completed to the extent that any information as to what may be done can be given.

We are further officially advised that a survey party under W. R. Maher, has left Cochrane for Moose Factory, Ont., to continue the investigations carried on during the past couple of years, as to the route for a line to that point, and the possibilities of harbor development at Moose Factory. The scope of the investigations was outlined in an address recently delivered before the Toronto branch of the Canadian Society of Civil Engineers by J. G. G. Kerry, Consulting Engineer to the Commission. (Mar., pg. 122.)

The Minister of the Interior gave notice in the Dominion Parliament, April 15, of a resolution providing for the transfer to the Province of Ontario of such portion of the Crown Lands now controlled by the Dominion Government in the Province of Manitoba, where such lands are necessary to make provision for the extension of the T. and N. O. Ry. to Port Nelson.

Toronto, Hamilton and Buffalo Ry.—Press reports state that arrangements are being made for largely increasing the company's yard accommodation at Brantford, Ont. (Mar., pg. 122.)

Toronto Terminals Ry.—Application is being made to the Dominion Parliament for power to increase the capital from \$10,000,000 to \$12,000,000.

The directors finally approved of the plans for the new union station in Toronto, April 6, and application was made for the approval of the Board of Railway Commissioners, at the sittings held in Toronto, April 24. It is said that tenders will be called for at once for the buildings. J. R. W. Ambrose is Chief Engineer. (April, pg. 166.)

Winnipeg.—The railway which is about to be built by the Greater Winnipeg Water District, will start from where the aqueduct will cross the Grand Trunk Pacific Ry. east of the Red River, and will extend to Indian Bay on Shoal Lake, a part of the Lake of the Woods, 85 miles. The first 16 miles will be built across the prairie on a location about six miles from the G. T. P. Ry. The rest of the country is largely rock and muskeg, but is not heavy. The grade for the entire 85 miles will not exceed 300 ft. The right of way which is being provided for railway and aqueduct, runs from 250 to 300 ft. wide, and is being cleared. Ties and other lumber for the work are being provided either from the right of way or from the adjoining territory. The construction of the railway is being pushed ahead rapidly, as it is desired to have it practically completed this year. (April, pg. 167.)

Railway Lands Patented.—Letters patent were issued during February, in respect of Dominion railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

	Acres.
Calgary and Edmonton Ry.	2,874.55
Canadian Northern Alberta Ry.	4.01
Canadian Northern Ry.	693.495
Canadian Pacific Ry.	340.544
Manitoba Southwestern Colonization Ry.	23.69
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	1,758.00
Total	5,694.289

G. T. R. Apprentices' Annual Dinner. The second annual dinner of the apprentices of the Motive Power Department was held at the Windsor Hotel, Montreal, Apr. 9. W. D. Robb, Superintendent of Motive Power, occupied the chair, and speeches were made by W. McNab, Principal Assistant Engineer, A. A. Maver, Master Mechanic, Montreal, and R. Patterson, Master Mechanic, Stratford, Ont.

The British Columbia Minister of Railways has ordered that the regulations set forth in the Dominion Board of Railway Commissioners' general order 102 with respect to railway safety appliances standards, shall be adopted by the B. C. Department of Railways in respect of all railways operated under special acts of the B.C. Legislature, and incorporated under the Railways Act.

Railway Route Maps Approved.—The acting Minister of Railways approved of the following route maps, Apr. 1.—Calgary and Fernie Ry.,—from Fernie to Kananaskis Pass, about 83 miles; and Pointe aux Trembles Terminal Ry.,—from Montreal Harbor Commissioners' boundary, Pointe aux Trembles Parish, to Canada Cement Co.'s mill, about 1.5 miles.

G. T. R. Coal Rates. The Interstate Commerce Commission has suspended from May 1, to July 30, the G. T. R. tariff increasing rates on coal in carloads from interstate points to certain points on the Chicago and North Western Ry., in the Chicago switching district.

The Death of Sir William Whyte.

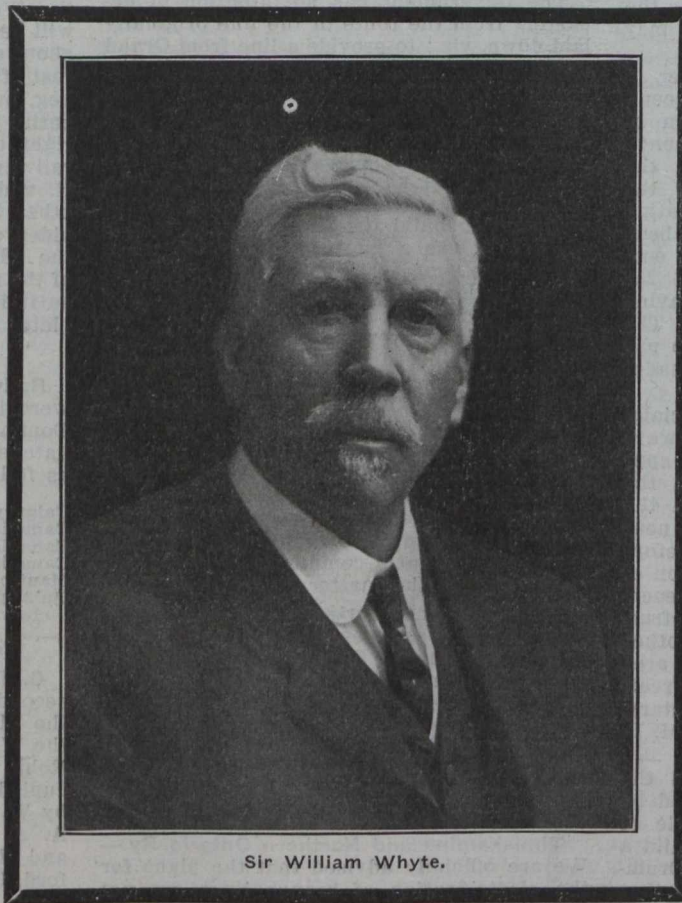
The death of Sir William Whyte, which occurred at the Hotel Del Coronado, San Diego, California, April 14, was a great shock even to his intimate friends, who though they knew he was ill, had no apprehension of a fatal result. The public manifestation of regret, not only in the vast territory between Lake Superior and the Pacific Coast, which owes so much of its development to his foresight and great ability, but throughout Canada, is a remarkable tribute to the character of the man, who is referred to by the Manitoba Free Press as "the most distinguished private citizen of Western Canada." The writer of this article, whose intimate acquaintance with Western Canada dates back to 1879, has never before witnessed such widespread feeling of sorrow and has no hesitation in saying that no death since the inception of that vast territory has been so widely regretted. Flags were half masted through the whole territory from Port Arthur to Vancouver and the entire press bore tribute to the great loss sustained.

William Whyte was born at Charleston, Fifeshire, Scotland, Sept. 15, 1843. He commenced his railway career with the West of Fife Ry., May, 1862, and after about two years service, came to Canada, July, 1863, after which his record was as follows:—To Apr., 1864, brakeman, G.T.R., Cobourg, Ont.; Apr., 1864 to 1866, freight clerk, G.T.R., Cobourg, Ont.; 1866, freight clerk, G.T.R., Toronto; 1866 to 1867, foreman, Freight Department, G.T.R., Toronto; 1867 to 1868, yardmaster, G.T.R., Toronto; 1868 to 1870, conductor, G.T.R.; 1870, night station master, G.T.R., Toronto; 1870 to 1874, station agent, G.T.R., Stratford, Ont.; 1874 to 1880, station master and Freight and Passenger Agent, G.T.R., London, Ont.; 1880, Freight Agent, G.T.R., Toronto; 1880 to Apr., 1883, Division Superintendent, G.T.R., Toronto; Apr. to Oct., 1883, General Superintendent, Credit Valley Ry., Toronto; Oct., 1883, to May, 1884, General Superintendent, Ontario and Quebec Ry., which included the Credit Valley Ry., and the Toronto, Grey and Bruce Ry., Toronto; May 1, 1884, to May 1, 1885, General Superintendent, Ontario Division, C.P.R., embracing all lines in Ontario west of Smith's Falls Jct., Ont.; May 1, 1885, to Oct. 1, 1886, General Superintendent, Eastern and Ontario Divisions, C.P.R. He went to Winnipeg in October, 1886, as General Superintendent of the then Western Division, in charge of all lines between Lake Superior and British Columbia's eastern boundary. On May 3, 1897, he was made Manager of all lines west of Fort William to the Pacific Coast, and in 1901 was appointed Assistant to the President. In Dec., 1903 came the crowning point in his career, when he was appointed Second Vice President, in general charge of the maintenance and operation of the Western Lines, and, under the President's direction, of the administration of the company's affairs in the territory between Lake Superior and the Pacific Coast. Never has any other railway appointment in Canada been so popularly acclaimed. The people and the press throughout the west unanimously gave expression to the general feeling of satisfaction and a new era of relations between the company and the western public was inaugurated. In

June, 1910, when the numerical designations of the Vice Presidents were abolished he became Vice President, retaining the same jurisdiction as before. In June, 1911, he was knighted, and in Sept., 1911 he retired from active service and was elected a director of the company.

He was married in Toronto in 1871 to Miss Jane Scott, who survives him, as well as his only son William, and four daughters, Mrs. J. F. Fisher, Winnipeg; Mrs. C. Meek, Vancouver; Mrs. J. A. Hunter, Minneapolis, and Miss Gladys Whyte.

Under ordinary circumstances Sir William would have retired from the C.P.R. service in 1908, when he attained 65 years of age, but as Sir Thomas Shaughnessy stated in announcing the retirement at a dinner in Winnipeg in Sept., 1911, he personally solicited Sir William to remain in



Sir William Whyte.

office for a few years longer. In the years that elapsed prior to Sir William's retirement in 1911 when he was elected a director of the company, the wisdom of the C.P.R. directorate in placing him at the head of its western affairs became plainer day by day. He administered its great interests with conspicuous ability and unwearying devotion, and while maintaining the company's position carried the public with him, by his absolute candor and fairness. The public confidence in his integrity was a most valuable asset to the company and enabled him to carry through many negotiations in a manner that very few indeed, if any other, men could have done. A notable instance of how he could maintain the company's position without alienating public opinion occurred in the eighties, when the Northern Pacific Rd., backed by the Manitoba Government, the Winnipeg Board of Trade, and in fact the citizens generally, attempted to lay a track across the C.P.R. in the Fort Rouge suburb of Winnipeg. Mr. Whyte

having been apprised of what was to be attempted, was on the spot with a small army of men, before the N.P.R. forces arrived. He effectually prevented the laying of the crossing, for which there was no legal authority, but so judiciously handled the delicate situation that he made no enemies for himself or the company. The historic name, Fort Whyte, will ever be a reminder of this memorable incident, when most serious trouble might easily have occurred had the protection of the company's interests been in the hands of a less diplomatic man.

As was remarked in Canadian Railway and Marine World in Oct., 1911, his withdrawal from active railway work was an event of really national importance, and the announcement was received with deep regret, not only throughout the vast territory of empire extent west of Lake Superior, where he had general charge of all the company's great interests, but in every part of Canada, his name being a household word from the Atlantic to the Pacific. Among the other officers and the employes of the Western Lines there was the deepest regret at the severance of the tie with their chief of so many years. Absolutely fair in every respect, Sir William was looked on as the friend of everyone on the pay roll and everyone knew that he could always get a patient and fair hearing and that he would not be the victim of any injustice or hasty action.

The history of Sir William's administration of the vast territory under his jurisdiction is practically the history of its general development and expansion. From a comparatively small mileage, he saw the company's lines west of Lake Superior grow many times over, until the Western Lines alone have to-day more mileage than many of the more important systems on this continent. Most of the mileage was constructed on his initiative and recommendation, in which and many other respects he took a foremost position as a great empire builder.

Last year Sir William intended going on a trip round the world, but was prevented by indisposition from which he apparently recovered. When he left Winnipeg early in February he was suffering from pyelitis, but it was believed that the change to California would restore him to health. He enjoyed golf and motoring there to some extent, but complications set in and at times he suffered acutely, but he was apparently getting better and up to a couple of days before his death wrote letters to some of his intimate friends, in fact the attending physician stated that on the morning of his death there was nothing to indicate that it was so near, though he had had no hope for some weeks that Sir William would recover. Lady Whyte and his youngest daughter, Gladys, were with him when he died. His only son, William, left Winnipeg immediately, on being advised of his father's death, and Sir William's private secretary, P. J. Boyce, also went to meet the body, which was taken to Winnipeg via Omaha in a special car.

The funeral at Winnipeg on April 22 was the occasion of a great demonstration of the public's grief. The body lay in state in Knox church, which was visited by vast throngs. A private service was held at the house and a public one at Knox church, the coffin being carried by representatives of the locomotive drivers, locomotive firemen, conductors, trainmen, machinists, mainten-

ance of way men from the C.P.R., and inspectors and conductors from the Winnipeg Electric Ry. The pallbearers were Sir Daniel McMillan, Geo. Bury, N. G. Leslie, A. M. Nanton, J. A. M. Aikins, J. T. Gordon, D. K. Elliott, G. R. Crowe, K. McKenzie, James Fisher. Business in Winnipeg was practically suspended during the funeral, and the streets were lined with parallel rows of people who evidently felt that they had lost a friend. From 3.15 to 3.18 p.m. all trains on the C.P.R.'s western lines and the Winnipeg Electric Ry.'s cars were stopped. Sir Thomas Shaughnessy, President, C.P.R., went from Montreal, and there were a large number of the western cities from Fort William to the coast officially represented by their mayors. Railway officials from the C.P.R. lines and also from the other roads were present in scores, while among the mourners were hundreds of the railroad rank and file.

Winnipeg Press Comments.

Following are extracts from the three Winnipeg daily papers, which are indicative of the expressions of the western press generally:

Winnipeg Free Press:—"It is a simple matter of fact that everyone who came in contact with him—and during the past quarter of a century and more there has been no man in Western Canada with whom a greater number came in contact—regarded him with respect, which was of a quite remarkable quality in its blending of confidence, and admiration and strong personal liking. His was a personality that attracted liking and confidence. He was a big man, in every sense of the word—a man of big bodily frame, of big mind and of big heart. No man has ever been better known throughout the West, and better liked. * * * He will live long in the remembrance of the West as a true man, behind whose dignity of manner there was a genuine, kindly spirit that put all sorts and conditions of people in the mood of frank, straightforward speech. His growing power as a man of affairs in the world never altered in the least the simplicity of his nature or of his relations with his friends or his feeling about the values of life."

Winnipeg Telegram:—"In the philosophy of worth-while people Sir William Whyte attained a high position. In the world of finance his striking personality was a factor and his busy life led him into many channels which make for the progress of the country. He acquired commanding prominence as the directing genius of the great railway with which he was connected west of the lakes. * * * There can be no greater tribute to his fine qualities than the sincere respect with which he has so long been regarded among the humblest of the men with whom he was so long associated in his life-work. A man of singularly pleasing address, a large grasp of affairs, his energetic career embodies, in the best sense, the spirit of the west. * * * He will be mourned by thousands as one of those strong characters whose charming personality and considerate disposition invited general confidence."

Winnipeg Tribune:—"It falls to the lot of very few men, and especially men of prominence, to enjoy in such a universal degree the sincere respect and affection of the public as was possessed by Sir William Whyte, whose somewhat untimely end has created such a shock to the community and left such a void in its social and business life. The Tribune, which has known Sir William intimately for nearly 35 years, can truthfully say that it knows of not one single enemy he has ever made, and it has never in that long stretch of years heard an unkind or unfriendly word said about the man, who, in connection with the active railway life of the country, enjoyed such a

commanding position and participated so largely in the development and upbuilding of the Canadian West."

A Letter from Sir William Whyte.

When Sir William retired from active service, in 1911, the Managing Director of Canadian Railway and Marine World wrote him expressing thanks for courtesies and kindnesses extending over a long period of years, and received in reply a letter from Sir William, which said in part:—

"I assure you that it has always been a pleasure to me to be able to assist you in building up a magazine that is now a standard of excellence in its get up, and correctness in the valuable information it disseminates. I have always valued your friendship since I first had the pleasure of becoming acquainted with you and I can truthfully say that I have felt your friendship to be genuine. It is my earnest desire that nothing will ever intervene to lessen or mar that friendship. It is also my sincere wish that the Railway and Marine World may grow in influence and interest as the years go by and that it will not only be a source of pride to you, its creator, but that it will also be a source of profit."

"A word about my retirement. For some time past I have felt that the duties of my position were becoming more and more strenuous each year; that if any serious illness befell me my recuperative powers could not be as good as they were 20 or 25 years ago. Besides, I believe that when a man reaches my time of life, filling some high position, that in order to give the officers associated with him in the business some opportunity for advancement, he should retire. I also feel that if I were to enjoy the balance of my days I should not wait until I had to retire through ill health. I will no doubt feel a little lonesome sometimes, almost like a clergyman in politics, but I have a number of interests in Winnipeg that will give me a reasonable amount to do."

Ownership of Canadian Northern Terminals, etc.—In the House of Commons recently the acting Minister of Railways stated, in answer to questions by the Hon. H. R. Emmerston, ex-Minister of Railways, that the C.N.R. terminals at Quebec, Montreal, Port Arthur, Winnipeg, Moose Jaw and other points except Port Mann and Vancouver, are owned by the Canadian Northern Ry. System Terminals, Ltd., the capital stock of which terminal company is owned by the Canadian Northern Ry. Company. The terminals at Vancouver and Port Mann are owned by the Canadian Northern Pacific Ry. Co., the stock of which company is all owned by the Canadian Northern Ry. Co. The title of the right of way through Carleton county, Ont., is owned by the Canadian Northern Ontario Ry. Co.

Canadian Ticket Agents Association.—As stated in our April issue, the Chicago and Northwestern, Union Pacific and San Pedro, Los Angeles and Salt Lake Lines recently tendered the C.T.A.A. a complimentary trip to Denver, Salt Lake City, Los Angeles and San Francisco for October, and the same was accepted, conditional on the C.P.R. and G.T.R. providing free transportation from Canadian points to Chicago and return. Opposition to the acceptance of the invitation appears to have developed in the C.P.R. and G.T.R. passenger departments, and a conference was held recently between the Passenger Traffic Managers of those two lines and the Association's executive. No official statement as to what took place is available, but it is said the difficulty in the way has not been removed and that the trip may have to be abandoned in consequence, in which case Halifax, N.S., may be selected for the annual meeting.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1912-13, from July 1, 1913:—

	Gross Earnings	Expenses	Net Earnings	Increase
July	\$1,928,800	\$1,414,500	\$514,300	\$19,700
Aug.	1,824,800	1,416,200	408,600	87,800
Sept.	1,994,900	1,470,000	524,900	101,400
Oct.	2,687,100	1,683,000	1,004,100	298,800
Nov.	2,673,300	1,708,500	964,800	87,000
Dec.	2,256,000	1,632,000	624,000	43,000
Jan.	1,570,900	1,218,000	352,900	82,700
Feb.	1,324,600	1,086,000	238,600	x29,900
	\$16,260,400	\$11,628,200	\$4,632,200	\$640,500
Incr.	\$ 1,708,400	\$ 467,900	\$ 640,500	.....

x Decrease.
Approximate earnings for March, \$1,533,300 against \$1,685,900 for March, 1913.

Canadian Pacific Railway, Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1912-12, from July 1, 1913:—

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	\$11,993,062.27	\$7,876,269.00	\$4,116,793.18	x\$331,383.72
Aug.	11,434,459.88	7,473,320.64	3,961,139.24	x756,786.42
Sept.	12,157,082.17	7,741,503.48	4,415,578.69	165,274.84
Oct.	14,480,216.73	8,877,358.94	5,602,857.79	541,970.60
Nov.	13,407,015.31	8,518,769.25	4,888,246.06	630,107.02
Dec.	11,814,325.67	7,587,508.96	4,226,821.71	x168,897.80
Jan.	7,916,216.25	6,916,042.19	1,000,174.06	x662,199.72
Feb.	7,594,172.73	6,122,596.27	1,471,576.46	1,048,492.88

\$90,796,551.01 \$61,113,363.82 \$29,683,187.19 \$1,630,408.08
Decr. \$2,156,933.30 \$ 526,525.22 \$ 1,630,408.08

x Decrease.
Approximate earnings for March, \$9,298,000, against \$10,965,000 for March, 1913.

Grand Trunk Railway Earnings, Etc.

The following figures show the earnings of the G.T.R., C.A.R., G.T.W.R., and D.G.H. & M.R. from Jan. 1 to Feb. 28, and increases, or decreases, from the figures for same period, 1913:—

	1914	1913	Increase	Decrease
G.T.R.	\$9,021,363	\$9,704,824	.....	\$683,461
C.A.R.	517,326	546,351	.....	29,025
G.T.W.R.	1,654,884	1,716,621	.....	61,737
D.G.H. & M.R.	549,088	531,147	\$17,941	.....

Totals.....\$11,742,661 \$12,498,943

Approximate earnings for March, \$4,433,671, against \$4,678,681 for March, 1913.

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section and Lake Superior Branch, 1,104 miles, for March, were \$461,997 against \$415,377 in March, 1913. The aggregate earnings for three months ended Mar. 31, were \$1,143,807 against \$1,167,305 for same period 1913.

Suburban Steam Railway for Toronto.—

In an address on city planning at the city development exhibition in Toronto, April 11, J. P. Hynes, advocated the building of a line running east and west from the Yonge St. crossing to a point 25 miles distant on each side from the heart of the city. There would be a grand central station built at Yonge St. and a number of stations at various distances along the line. The road would have direct connection with all railways and would open up a large amount of good residential districts which have now practically no transportation facilities. The road would also bring the present residents nearer to the city through rapid transportation. The road would also have separate tracks for local and express service and would be in a position to handle freight. Eventually it could be linked up with the suggested railway to be operated by the Harbor Commission, and in this way would belt the city.

The Railway Signal Association will hold its summer meeting at New York, May 27 and 28.

Mainly About Transportation People.

C. N. MONSARRAT, M. Can. Soc. C.E., Chairman, Quebec Bridge Commission, and Mrs. Monsarrat, are visiting Europe.

HUGH SUTHERLAND, Executive Agent, Canadian Northern Ry., Winnipeg, and Mrs. Sutherland, are in Europe.

N. J. HOLDEN, President of the Holden Co., railway supplies, etc., Montreal, who has been in Europe with Mrs. Holden, for some months, is expected back in May.

J. E. LONG, Safety Engineer, Canadian Government Railways, lectured on the Safety First movement at Moncton, N.E., Apr. 7.

G. F. BAER, President Philadelphia and Reading Ry. was stricken in the street at Philadelphia, April 25, with what physicians believed to be a stroke of paralysis. His death was announced shortly after.

W. WAINWRIGHT, Vice President, G.T.R. and G.T. Pacific Ry., Montreal, was absent from his office for several days early in April owing to a severe cold.

D. POTTINGER, I.S.O., formerly Assistant Chairman, Canadian Government Railways Managing Board, has been appointed an Esquire of the Order of the Hospital of St. John of Jerusalem.

F. P. BRADY, General Superintendent, Canadian Government Railways, who was in the Southern States for a few weeks, has returned to Moncton, N.B., and resumed his duties.

J. S. DENNIS, Assistant to the President, C.P.R., Calgary, Alta., addressed the members of the Lethbridge Board of Trade recently, chiefly on the duties of boards of trade in general.

D. C. COLEMAN, General Superintendent, Alberta Division, C.P.R., Calgary, addressed a meeting of the chief clerks of the division there recently, on the problems affecting chief clerks.

C. E. McPHERSON, Assistant Passenger Traffic Manager, C.P.R., Winnipeg, visited Los Angeles, Cal., recently, to attend the Western Transcontinental Passenger Agents Association's meeting.

J. E. McLEOD, Superintendent, Toronto District, Railway Mail Service, Post Office Department, has been granted three months leave of absence, at the expiry of which he will be superannuated.

R. COLCLOUGH, District Superintendent, Intercolonial Ry., Levis, Que., who acted as General Superintendent at Moncton, N. B., during the absence of F. P. Brady, has resumed his own duties.

F. W. COWIE, M. Can. Soc. C.E., Chief Engineer, Montreal Harbor Commissioners, has been awarded the Telford gold medal by the British Institute of Civil Engineers, for his paper on transportation problems in Canada and the Montreal harbor.

F. DANE, one of the Commissioners operating the Timiskaming and Northern Ontario Ry., on behalf of the Ontario Government, has resigned on his appointment as Trade Commissioner at Glasgow, Scotland, for the Dominion Government.

P. A. CRYSLER, who recently resigned the position of Assistant Master Car Builder, Eastern Lines, C. P. R., Montreal, has entered the service of The Holden Co., Ltd., dealers in railway supplies, etc., Montreal.

T. E. DRINKWATER, who had been in C. P.R. service for 25 years in Montreal and Fort William, Ont., in which latter place he spent 20 years, and who died there, Apr. 10, was a brother of the late C. Drinkwater, at one time Secretary, C.P.R. Co., and Assistant to the President.

F. SANDY, station agent, G.T.R., Peterboro, Ont., was, on Apr. 13, presented with a Morris chair, a silver tea service and club bag, by a number of local business men, and with a writing desk by the local employes, on leaving for Lindsay, Ont., where he has been transferred in a similar position.

A. M. NANTON, who was formerly Managing Director Alberta Ry. and Irrigation Co., and who is intimately connected with various transportation interests, in Western Canada, as well as being a Governor of the Hudson's Bay Co., returned to Winnipeg, Apr. 13, after a prolonged absence in Europe.

J. E. ROBERTS, heretofore Superintendent, Quebec, Montreal and Southern Ry., and Napierville Jct. Ry., Sorel, Que., has been appointed General Superintendent, Greenwich and Johnsonville Ry., Greenwich, N.Y., vice T. J. Lynch. The companies named are subsidiaries of the Delaware and Hudson Co.



L. C. Fritch,

Assistant to the President, Canadian Northern Railway.

C. S. MELLEN, formerly President New York, New Haven & Hartford Rd., who has been under indictment for manslaughter in connection with a wreck on that road, over a year ago, has been discharged from custody, on the ground that there is no evidence to connect him directly with the cause of the wreck, nor of gross negligence.

ALBERT HENRY SWEETMAN, whose appointment as Car Foreman, Canadian Northern Ry., North Battleford, Sask., was announced in our last issue, was born at Kensington, Eng., Feb. 25, 1883, and entered C.N.R. service in Mar., 1905, since when he has been, to Aug., 1910, in car shop, Winnipeg; Nov., 1910, to Feb., 1914, Assistant Foreman Repair Track, Winnipeg.

J. E. LONG, who has been employed by the Canadian Government Railways in connection with the safety first movement, was originally employed, the acting Minister of Railways told the House of Commons recently, in a similar capacity on the New

York Central and Hudson River Rd., and is in receipt of a salary of \$175 a month from the Government.

W. G. ROSS, Chairman, Montreal Harbor Commissioners, who, in company with F. W. COWIE, Chief Engineer, has been touring the chief harbors in Europe, with the view of obtaining information which might be of use in the developing of the harbor at Montreal, left London, Eng., recently for Nice, France, to meet Mrs. Ross. The party hopes to return to Canada during May.

JOSEPH GRAHAM, who has been appointed Assistant Roadmaster, C. P. R., North Bend, B. C., was born in Ontario, May 23, 1870, and entered C. P. R. service, Mar. 24, 1898, since when he has been, to Mar. 18, 1899, track laborer, Ashcroft, B. C.; Mar. 18, 1899 to Sept. 22, 1913, section foreman, Ashcroft and Kamloops, B. C.; Sept. 22, 1913, to Mar. 12, 1914, extra gang foreman, Kamloops and Tranquille, B. C.

CY WARMAN, who died at Chicago, Ill., Apr. 7, following a paralytic stroke, had been connected with the literary department of the General Advertising Agent's office, G.T.R., for several years. He achieved considerable success as a magazine writer, and in 1910 was President of the American Press Humorists' Association. In his early days he had worked as a locomotive wiper, fireman and driver in Colorado.

A. W. JONES, who has been appointed Commercial Agent, Chicago, Milwaukee and St. Paul Ry., Toronto, was born at Montreal, July 4, 1889, and entered railway service in Aug., 1903, since when he has been, to Nov., 1908, clerk, General Passenger Department, C.P.R., Montreal; Nov., 1908, to Apr., 1911, Soliciting Agent, Great Northern Ry., Montreal; Apr., 1911, to Feb., 1914, Travelling Freight and Passenger Agent, Chicago, Milwaukee and St. Paul Ry., Toronto.

JAMES J. NELLIGAN, whose appointment as Division Freight Agent, Canada Steamship Lines, Montreal, was announced in our last issue, was born at Hamilton, Ont., Jan. 20, 1876, and entered transportation service in 1892, since when he was, to 1904, in various positions, G.T.R. at Hamilton, St. Catharines, Ingersoll, Ont., and Montreal; 1904 to 1907, Travelling Freight Agent, Northern Navigation Co., Montreal; 1907 to March, 1914, General Agent, Canadian Lake Line, Montreal.

JOHN A. TAIT, District Freight Agent, Canadian Northern Ry., Regina, Sask., who resigned from railway service recently to enter the contractors' and builders' supply business there, was, from Oct. 1907, to Dec. 1908, clerk in the general office, C.N.R., Winnipeg; Jan. to Sept., 1909, City Freight Agent, Winnipeg; Oct., 1909, to Apr., 1910, Travelling Freight Agent, Winnipeg; May, 1910, to May, 1911, City Freight Agent, Regina, Sask.; June, 1911, to Apr., 1914, District Freight Agent, Regina, Sask.

LOUIS C. JACK, who has been appointed District Freight Agent, C. P. R., Kansas City, Mo., was born in California, Nov. 18, 1876, and entered railway service in 1896, since when he has been to Dec. 1900, clerk, local office, Chicago, Rock Island and Pacific Ry., Kansas City, Mo.; Dec. 1900 to June 1901, rate clerk, Chicago Great Western Ry., Kansas City, Mo.; June 1901 to Oct. 1905, chief rate clerk, general office, Union Pacific Rd., Kansas City, Mo.; Oct. 1905 to Apr. 1, 1914, Agent, C. P. R. Kansas City, Mo.

R. F. MACFARLANE, for several years in charge of the passenger business of the Dominion Line, the White Star-Dominion Line, and latterly of the White Star-Dominion, Canada and Austra-American lines, in conjunction with P. V. G. Mitchell, has re-

tired from active service, and taken up residence on his fruit farm at Winona, Ont. He entered the Dominion Line service in 1874, when it was known as the Mississippi and Dominion Steamship Co., with vessels running between Liverpool and New Orleans, and Liverpool and Montreal.

HAROLD T. MALCOLMSON, who has been appointed Superintendent, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., was born at Hamilton, May 22, 1877, and entered railway service in March, 1899, since when he has been, to Sept., 1899, stenographer to Superintendent, G. T. R., Toronto and Allandale, Ont.; Sept. 1899, to June, 1903, stenographer to General Superintendent, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont.; June, 1903, to Mar., 1912, chief clerk to General Superintendent, and General Manager, same road; Mar. 25, 1912, to Jan. 14, 1914, Car Accountant, same road; Jan. 14, to Mar. 31, 1914, Superintendent of Car Service, same road.

W. J. HUNTER, Commercial Agent, G. T. R., and Division Freight Agent, G. T. Pacific Ry., Winnipeg, died there, Apr. 8, following an apoplectic stroke. He was born at Toronto, Jan. 10, 1864, and had been in G.T.R. service for about 30 years. He moved to Winnipeg, Dec. 31, 1903, on his appointment as Commercial Agent, G.T.R., there, and in 1907, was also appointed Division Freight Agent, G. T. P. R. Prior to settling in Winnipeg, he was, at various times Soliciting Freight Agent, Detroit, Mich., Travelling Freight Agent, Battle Creek, Mich., and Commercial Agent at Buffalo and Pittsburgh, consecutively. The funeral took place at Detroit.

JAMES T. GARDNER, who carried on an extensive railway equipment business in Chicago, and was well known in Canada, died suddenly at his home, Apr. 9. He began his career in railway service as a telegraph operator with the Pennsylvania lines in 1876. Two years later he was made Superintendent of the Buffalo, New York, and Philadelphia Ry., which position he relinquished in 1881 to become General Superintendent of the Buffalo, Rochester, and Pittsburgh line. From 1887 to 1890 he was General Manager of the Cincinnati, Saginaw, and Mackinac Rd., and the following year he went into the railroad equipment business.

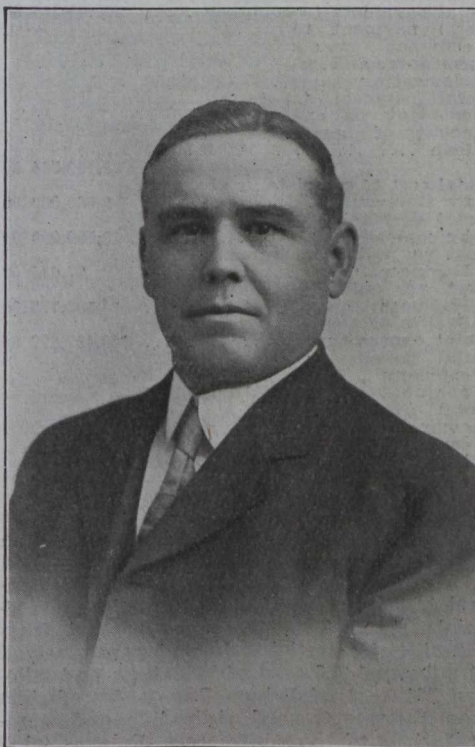
B. W. FOLGER, who died at Toronto recently, was born at Cape Vincent in 1838, and came to Canada about 50 years ago, settling in Kingston, where he was one of the founders of the firm of Folger Bros., who at one time controlled the lighting and street railway systems in Kingston, and were also the principal stockholders in the St. Lawrence River Navigation Co., and the Thousand Islands Steamboat Co., now owned by Canada Steamship Lines, Ltd. He was, from 1876 to 1895, Superintendent, Kingston and Pembroke Ry., and was subsequently General Manager. He was one of the founders of the Canadian Pacific Express Co., in 1880, and of the Donnelly Wrecking and Salvage Co., in 1890.

F. G. ADAMS, who has been appointed Commercial Agent, G. T. R., and Division Freight Agent, G. T. Pacific Ry., Winnipeg, was born at St. John's, Nfld., Apr. 6, 1878, and entered railway service Sept. 4, 1893, since when he has been, to Dec. 31, 1902, clerk, general offices, G. T. R., Montreal; Jan. 1, 1903, to Mar. 31, 1907, Contracting Freight Agent and Travelling Freight Agent, G. T. R., Montreal; Apr. 1, 1907, to Aug. 31, 1908, Contracting Freight Agent, G. T. R., Winnipeg; Sept. 1, 1908, to July 31, 1911, Travelling Freight Agent, G. T. R., Winnipeg; Aug. 1, 1911, to July 14, 1913, Commercial Agent, G. T. Pacific Ry., Regina,

Sask.; July 14, 1913, to Apr. 16, 1914, Division Freight Agent, G. T. Pacific Ry., Edmonton, Alta.

ROBERT BRUCE McINTOSH, who has been appointed chief clerk, General Freight Office, Canadian Northern Ry., Winnipeg, was born at Waterville, Que., July 5, 1888, and entered railway service, Sept. 10, 1904, since when he has been, to Sept. 1, 1905, clerk, General Purchasing Agent, C.P.R., Montreal; Sept. 1, 1905, to Aug. 31, 1906, clerk, Purchasing Department, Canada Car Co., Montreal; Aug. 31, 1906, to Oct. 19, 1907, in Freight Department, Canadian Northern Ry., Edmonton, Alta.; Oct. 19, 1907, to Sept. 10, 1909, in General Freight Office, G.T.R., Montreal; Sept. 10, 1909, to Mar. 30, 1910, in General Freight Office, C.N.R., Winnipeg; Mar. 30, 1910, to Nov. 18, 1911, in private business; Nov. 18, 1911, to Mar. 15, 1912, in General Freight Office, C.N.R., Winnipeg; Mar. 15, 1912, to Jan. 10, 1914, chief clerk, District Freight Office, C.N.R., Saskatoon, Sask.

HENRY BEATTY, who died at Toronto, Apr. 10, was born at Cootehill, Ireland, May



R. Preston,

Assistant Superintendent of Motive Power, Western Lines, Canadian Pacific Ry.

1, 1834, and came to Canada with his parents, in 1843. In 1870, in conjunction with some relatives, he started a steamship business at Sarnia, Ont., and operated vessels to the upper lakes, under the name of J. and H. Beatty and Co. In 1877 the name was changed to Northwest Transportation Co., and he continued to manage the company until 1882. On the inauguration of the C. P. R. Upper Lakes Service he was appointed in charge, and remained in that capacity until 1892, when he retired from active service. He retained an intimate connection with the C. P. R. Steamship Department up to his death, and also acted as representative of the British Marine Underwriters. Of his sons, Dr. H. A. Beatty is Chief Surgeon, and E. W. Beatty is General Counsel, C. P. R.

B. R. MARSALES, who has been appointed District Freight Agent, Canadian Northern Ry., Regina, Sask., was born at Guelph, Ont., Apr. 13, 1887, and entered railway service, July 25, 1901, since when he has

been, to Aug., 1902, clerk, Hamilton, Grimsby and Beamsville Electric Ry., Hamilton, Ont.; Aug., 1902, to Mar., 1905, billing clerk, Michigan Central Rd., Suspension Bridge, N.Y.; Mar., 1905, to Mar., 1906, rate clerk, Central Railway Clearing House, Buffalo, N.Y.; Mar., 1906, to Apr., 1910, billing clerk, New York Central and Hudson River Rd., Buffalo, N.Y.; Apr., 1910, to Feb., 1911, in private business; Feb. 5, to May 1, 1911, in general office, Canadian Northern Ry., Winnipeg; May 1 to July 15, 1911, City Freight Agent, same road, Winnipeg; July 15, 1911, to June 1, 1912, City Freight Agent, same road, Edmonton, Alta.; Jan. 1, 1912, to Apr. 1, 1914, Contracting Freight Agent, same road, Brandon, Man.

ALBERT E. LOCK, who has been appointed Car Accountant, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., was born at Albany, N. Y., July 14, 1879, and entered railway service, Dec. 1, 1896, since when he has been, to Sept. 1, 1897, telegraph operator and relief agent at various points, Lehigh Valley Rd.; Sept. 1, 1897, to July 1, 1902, tower man, telegraph operator, relief agent, ticket clerk, assistant agent, etc., Mohawk and Adirondack Divisions, New York Central and Hudson River Rd.; July 1, 1902, to Aug. 15, 1903, City Ticket Agent, same road, Lake Placid, N. Y.; Aug. 15, 1903, to Sept. 15, 1904, Travelling Passenger Agent, New York Central Lines, Saranac Lake, N. Y.; Sept. 15, 1904, to Nov. 1, 1913, Travelling Passenger Agent, New York Central Lines, Montreal; Nov. 1, 1913, to Apr. 1, 1914, Commercial Agent, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont.

ROBERT PRESTON, whose appointment as Assistant Superintendent of Motive Power, Western Lines, C.P.R., Winnipeg, was announced in a recent issue, was born at Toronto, July 28, 1863, and entered railway service in 1877, since when he has been, to 1878, machinist apprentice, G.T.R., Toronto; 1878 to 1882, machinist apprentice, Toronto, Grey and Bruce Ry., Toronto; 1882 to 1884, machinist, C.P.R., Winnipeg, and Toronto, Grey and Bruce Ry., Toronto; 1884 to 1887, machinist, C.P.R., Toronto; 1887 to 1890, Locomotive Foreman, C.P.R., Havelock, Ont.; 1890 to 1894, Locomotive Foreman, C.P.R., London, Ont.; 1894 to 1897, Locomotive Foreman, C.P.R., Smiths Falls, Ont.; 1897 to 1898, Locomotive Foreman, C.P.R., Montreal; 1898 to 1901, Locomotive Foreman, C.P.R., Toronto; 1901 to 1903, Master Mechanic, C.P.R., Lake Superior Division, North Bay, Ont.; 1903 to 1909, Master Mechanic, Ontario Division, Toronto; 1909 to Feb., 1914, Master Mechanic, Manitoba Division, Winnipeg.

L. C. FRITCH, Assistant to the President, Canadian Northern Ry., Toronto, of whom some biographical particulars were given in our last issue, and whose portrait appears in this issue, is a member of the following engineering and allied associations:—American Society of Civil Engineers, American Institute of Electrical Engineers, American Railway Engineering Association, American Association for the Advancement of Science, Western Society of Engineers and the Geographical Society. He was President, American Railway Engineering Association in 1910, a director from 1905 to 1913, and a member of the rail committee in 1913; a member of the railway committee of the American Institute of Electrical Engineers, from 1910 to 1913; chairman of the committee on engineering of the American Railway Association, in 1913; a member of the committee on electrical working, of the American Railway Association, from 1910 to 1913, and a member of the committee on electricity of the American Railway Engineering Association from 1910 to 1913.

Grand Trunk Pacific Railway Construction.

We have been favored by the Chief Engineer, B. B. Kelliher, with the following statement of work done during 1913. Construction on the main line was in progress, also on eight branches in Manitoba, Saskatchewan and Alberta. In the case of the main line construction was confined to British Columbia, being worked both westerly from the eastern boundary of the province, and easterly from Prince Rupert, the Pacific terminus of the railway. Approximately 275 miles of grading and 297.6 miles of tracklaying were done on the main line during the year, and on the branches a total of 80 miles of grading and 267 miles of tracklaying, respectively, was done, so that during the year 355 miles of grading and 564.6 miles of tracklaying were done on the entire system. This is exclusive of second track and sidings. Below is a brief description of each portion of the work:—

Main Line.—At the end of 1913 grade was completed to mile 1270 west of Winnipeg, track being laid to within five miles of that point. The substructures for the large steel structures of the third crossing at mile 1233, and the fourth crossing at mile 1278, of the Fraser River, were being built. Grading was fully under way and well advanced to completion all along the line westerly until the end of steel was reached at mile 323.9 east of Prince Rupert, or mile 1422 west of Winnipeg. Railway in operation from Prince Rupert, easterly to Bulkley summit, mile 300. Grading in Prince Rupert terminals well advanced.

Harte-Brandon Branch.—Length 25 miles. 21.85 miles of grading completed, but no track laid. Erection of Assiniboine River bridge substructure was in progress at end of 1913.

Regina Boundary Branch.—Length 155 miles. Completed and in operation.

Talmage to Weyburn Branch.—Length 15 miles. Grading completed. No track laid.

Moose Jaw North West Branch.—Length 67.86 miles. Grading and tracklaying completed to mile 67.

Prince Albert Branch.—Length 111.5 miles. Grading completed throughout. Track laid to mile 87.2, at which point there is a large steel bridge over the South Saskatchewan River, the erection of which had not been commenced up to the end of 1913.

Cutknife Branch.—Length 50 miles. Grade completed throughout. Track laid to mile 33 and should be completed during 1914.

Biggar-Calgary Branch.—Length 105 miles. Completed and in operation.

Calgary Branch.—Length 202 miles. Completed and in operation. Terminal work at Calgary has been commenced.

Speaking of the railway construction in the Dominion, in presenting the Railway Department's report to the House of Commons recently, the acting Minister said the construction of the line from Winnipeg to Prince Rupert, is divided into two sections—the prairie section from Winnipeg to Wolf Creek, and the mountain section from Wolf Creek to Prince Rupert. The first section is 914.9 miles, and is in full operation. There is some work at terminals yet to be completed, and some bridges and culverts to be put in permanent condition. The total amount expended to date upon this section is \$40,427,322.65. The mountain section is 830 miles. From Wolf Creek to Fort George, 363 miles, the road is graded and track laid, with the necessary sidings, and 326 miles have had a good lift of ballast. Some steel bridges have not yet been erected, but the traffic now going into Fort George is being carried over temporary bridges. The concrete substructures for the third and

fourth crossings of the Fraser River have been built. Station buildings have been erected to mileage 219 from Wolf Creek. From Prince Rupert easterly the line is completed and traffic is in operation for 339 miles, of which 100 miles have been fully ballasted, and 170 miles have received a first lift. Station buildings are either erected or are under construction on this mileage. There are 15 steel bridges yet to be erected to replace temporary pile structures. The intervening 128 miles, on which the acting Minister stated 90% of the grading had been completed, and steel was being laid at the date of the reports to him, have since been connected up with the east and west sections, the last spike having been driven by the Vice President, M. Donaldson, April 8. The total expenditure on the line is shown by the following general statement:

Mountain Section.—	
Total expenditure, as certified by	
Government Chief Engineer . . .	\$71,449,962 90
Company Chief Engineer	71,514,398 00
Total payments to company	52,139,534 50
Total payment to company upon guarantee and implementing same.	52,139,534 50
Total payment to company on account of special loan	7,000,000 00
	59,139,534 50
Total cost to complete as given by Government Engineer	9,089,000 00
Total cost to complete as given by company engineer	13,700,000 00
Cost per mile, Government Chief Engineer	97,035 00
Cost per mile, company Chief Engineer	102,775 00
Prairie Section.—	
Total expenditure	\$40,427,322 65
Total payment to company upon guarantee	\$11,135,482 91
Total payment to company on account special loan	10,500,000 00
	21,635,482 91
Estimated cost at completion	41,335,180 00
Cost per mile	45,180 00

The last mile of track on the main line from Winnipeg to Prince Rupert, was laid in the presence of Vice President and General Manager, M. Donaldson, and other officials, April 8. The party arrived from Winnipeg by special train, and were received at mileage 1,375 west of Winnipeg, and mileage 371 east of Prince Rupert, by officials from the western end of the line, and representatives of the contractors, Foley, Welch and Stewart. There was no special ceremony at the connecting up of the two sections of the line, and the special train immediately afterwards proceeded on its way to Prince Rupert, reaching there, April 9.

The line is 1,744.9 miles long, and is built throughout on a 0.4% gradient against east-bound, and on a 0.5% gradient against west bound traffic, with a maximum curvature of six degrees. The roadbed is 18 ft. wide and 80 lb. steel is used for the tracks. There are tangents on the prairie sections as long as 47 miles. Construction was started in Manitoba in 1905, and at Prince Rupert in 1908, and tracklaying was started Sept., 1906. Following are some of the principal features of the route:—

Elevation at Winnipeg, 767 ft. above sea level. For 160 miles west of Winnipeg line built on prairie level, reaching elevation of 1,650, with maximum grade of 0.5%—26.4 feet to the mile.

Banks of Qu'Appelle River followed for 35 miles.

Height of prairie land at mile 300 from Winnipeg, with elevation 2,225 (Touchwood Hills.)

Line follows prairie level at average ele-

vation of 2,000 from mile 330 to Wolf Creek, mile 915, end of prairie section.

Mountain section commences at mile 915 (Wolf Creek.)

Athabasca River Valley followed for 100 miles, thereafter the Miette River Valley, a tributary of the former, for 17 miles westerly.

Continental divide reached at elevation 3,723. This is Yellowhead Pass, the highest summit on the entire transcontinental system.

Line proceeds from the Pass to the headwaters of the Fraser River, skirting the north shores of Yellowhead and Moose Lakes.

Fraser River Valley is followed and crossed four times between Tete Jaune and Prince George, elevation dropping as course is proceeded westerly from 2,400 to 1,880.

Nechaco River flows into Fraser River at Prince George.

Nechaco River Valley followed for 116 miles between Prince George and Endako, elevation rising from 1,880 to 2,245.

From Endako westerly the line follows Endako River Valley and skirts the north shores of Burns and Decker Lakes, reaching the headwaters of the Bulkley River at Bulkley Summit, elevation 2,366. Bulkley River Valley followed in a northwesterly direction to Hazelton, elevation 985.

At Hazelton the Bulkley River flows into the Skeena River.

From Hazelton to Prince Rupert line follows the banks of the Skeena River, there being a gradual descent in elevation to sea level.

There are 65 large steel bridges on the line having a total length of 5.3 miles. They are all designed to the highest Dominion specifications for heavy traffic. The largest bridges on the prairie section are: South Saskatchewan, at Saskatoon, 1,500 ft. long and 71 ft. high. Battle River, mile 676 from Winnipeg, 5,440 ft. long, including approaches, and 190 ft. high. Clover Bar, over North Saskatchewan River, mile 786.5, 1,653 ft. long and 138 feet high. The largest bridges on the mountain section are: McLeod River, mile 915.6 from Winnipeg, 1,065 ft. long and 118 ft. high. Rau Shuswap, mile 1,124, from Winnipeg, 1,030 ft. long and 190 ft. high. Fourth Crossing, Fraser River, mile 1,278 from Winnipeg, 2,650 ft. long and 36 ft. high. The highest bridge is that over the Pembina River, 860 miles west of Winnipeg, rail level being 208 ft. above high water. The Fraser River is crossed four times, at mileage 1,073, 1,189, 1,233 and 1,278 from Winnipeg. The mainland and Karen Island, on which Prince Rupert is situated, are connected by the Zanardi Rapids bridge, 655 ft. long, and 33 ft. above high water.

The company has also built and placed in operation 940.10 miles of branch lines, and is completing 119 miles of additional branch lines this season. These are located as follows:—

	Total Mileage.	Completed.
Manitoba—		
Harte-Brandon	25	.....
Saskatchewan—		
Melville-Canora	55.20	55.20
Melville-Regina	98.40	98.40
Regina-boundary	155.00	155.00
Regina, Moose Jaw and N.W.	108.	90.20
Prince Albert branch	111.80	67.00
Battleford branch	48.50	48.50
Cutknife branch	50.00	3.60
Biggar-Calgary	104.06	104.06
Talmage-Weyburn	15.00	.....
Alberta—		
Tofield-Calgary	201.50	201.50
Alberta Coal branch	56.40	56.40
Mountain Park Coal branch	30.24	30.24

At the Canadian Railway Club's monthly meeting at Montreal, Apr. 14, J. E. Duval, General Superintendent of Car Service, G. T.R., read a paper on the misuse of cars and the causes of car shortage.

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TORONTO, CANADA, MAY, 1914.

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F. W. COWIE, M. Can. Soc. C. E., Chief Engineer, Montreal Harbor Commission, read a paper, Apr. 7, before the Institute of Civil Engineers, London, Eng., the general trend of which was to demonstrate the desirability of an all Canadian route from Great Britain and the European continent, with Montreal as the head.

Quick Time in Floating Operations on C.P.R. Lachine Bridge.

In publishing the article on the double tracking of the C.P.R.'s St. Lawrence River bridge at Lachine, by P. B. Motley, Engin-

Span.	Between piers nos.
Downstream—408 ft	13 and 14
Downstream—408 ft	12 and 13
Upstream—408 ft	12 and 13
Upstream—408 ft	13 and 14

eer of Bridges, C.P.R., in our last issue, the table showing the time occupied in the floating operations was inadvertently omitted. It should have followed the matter at the bottom of pg. 153, column 1, and is as follows:—

	Date floated into position.	Elapsed time.		Net time occupied in moving.	Total distance floated.
		Hrs. Min.	Hrs. Min.		
	Nov. 4/12	3—0	1—0	275 ft.	
	Nov. 22/12	2—30	28½	275 ft.	
	Sept. 18/13	1—30	22½	275 ft.	
	Oct. 6/13	2—0	16	275 ft.	

Canadian Freight Association Committees.

The following standing committees were elected at the annual meeting in Montreal, April 16:—

- ADVISORY**—C. E. Dewey, W. M. Kirkpatrick, G. H. Shaw, J. H. Meglemry.
- EXECUTIVE**—W. M. Kirkpatrick, F. F. Backus, G. Tombs, H. C. Martin.
- CLASSIFICATION**—W. M. Kirkpatrick, J. Edward, G. Tombs, F. J. Watson, E. N. Todd, L. Macdonald, H. E. Macdonnell, G. T. Pettigrew, R. E. Perry, M. H. Brown.
- FREIGHT INSPECTION**—R. W. Long, F. A. Shaw, M. H. Brown, R. W. Youngs, R. J. S. Weatherston, J. Edward, G. H. Clark, W. B. Bamford, W. S. Elliot.

The **General Utilities Corporation** has been incorporated under the Dominion Companies Act with power among other things to acquire and operate electrical power plants; to operate steam and other vessels; to build docks, wharves and warehouses. The capital is fixed at \$50,000; its office is at Sorel, Que., and the provisional directors are:—A. E. Pontbriand, Mrs. M. L. Pontbriand, J. A. Simiard, Mrs. R. B. Simiard, A. Petclere, Sorel, Que.; G. E. Pontbriand, Shawinigan Falls, Que.

Plans for the **C. P. R. Building** at the San Francisco exhibition of 1915 have been prepared. The building, which was designed by F. S. Swales, will cover a ground space of 65 feet square, and will be a one story structure in the Spanish renaissance style. The roof will be of tile and the wide cornice will be colored to conform with the general style of the neighboring buildings. The interior will be divided into an exhibition hall, and a moving picture hall.

The **Ottawa City Cartage Co.** has been incorporated under the Ontario Companies Act to carry on a general cartage and forwarding business, in connection with railways, steamships, etc., and particularly to take over the business at present carried on by the City Cartage Co. Its capital is fixed at \$40,000; its office is at Ottawa, and its provisional directors are: G. S. Kelley, W. L. Scott, A. J. Fraser, M. J. Brennan, and L. E. Milks.

The **Ottawa Motor Transportation Co.** has been incorporated under the Ontario Companies Act to carry on the business of cartage contractors, warehousemen, and other allied businesses in Ottawa and elsewhere throughout Ontario. The capital is fixed at \$40,000; its office is at Ottawa, and the provisional directors are:—G. D. Kelley, C. H. Maclaren, A. J. Fraser, M. J. Brennan and L. M. Sibley, Ottawa.

Hamilton Incline Ry.—Orders have been placed with the Canadian Electric Co., for one special double fixed drum, double geared electric Lidgerwood incline hoist, two C. G. E. 180 h.p., 550 volt, d.c. motors with special automatic control; one C. G. E. motor generator set; one Tudor storage battery of 262 F. 11 cells, and one C. G. E. four panel switchboard.

Dredge for Little Current Work.

A dipper dredge, which is being built for the C. S. Boone Dredging and Construction Co., of Toronto, for use at Little Current, Ont., was launched by M. Beatty & Sons, Ltd., at Welland, Ont., April 13. It is of steel, 100 ft. long, 40 ft. wide, 10 ft. deep at bow, and 8 ft. at stern. It is of the crane type, the crane being 40 ft. long. The dipper is of 5 cu. yds. capacity, the dipper handle is 61 ft. long, which will allow it to make 40 ft. of water. The main engine is double cylinder, 15 in. bore by 15 in. stroke, the boiler 10 ft. dia. by 12 ft. long, of the Scotch marine type. Each bow anchor or spud is operated by an independent reversible engine, 10 in. bore by 10 in. stroke, compound geared, the anchors being raised and pinned up by steel cable. The engine for handling the stern anchor is 9 by 9 compound geared. On each side of the deck forward is a 7 by 7 double cylinder, triple friction, drum engine, to be used for warping the dump scows into position. It is expected to have the dredge completed and ready for towing early in May.

A new type of coal chute has been installed on a large coal pier of one of the larger U. S. lines. The chutes, which will be telescopic, and automatic in operation, will be attached to the end of the pocket through which the coal passes when leaving the car, and will be adjusted to an angle which will eliminate a large amount of the destructive effect of gravity.

Electrification of the Norwegian Government railways is the subject of a newly submitted report by a special commission. The excessive prices of imported coal (Norway having no coal mines) led to the investigation of the feasibility of using "white coal," and the electrification of seven trunk lines at a cost of \$9,000,000 is recommended.

The gas electric car which was operated on the Quebec and Lake St. John Ry. between Quebec and Lake St. Joseph during the past two summers, and which has been running on the Canadian Northern Ontario Ry. between Picton and Napanee, Ont., during the past winter, will continue in the latter service this year.

F. G. Smith, Chief Draughtsman, Canadian Allis-Chalmers Ltd., read a paper on steel railway bridges before the Central Railway and Engineering Club, in Toronto, April 28.

N. C. Stibbs, Storekeeper, C.P.R., Lethbridge, in remitting his renewal subscription to Canadian Railway and Marine World writes:—"Please find enclosed subscription to your valuable paper for 1914."

H. M. Gain, Trainmaster, G.T.R., Belleville, Ont., writes:—"I value very much the information contained in each issue of Canadian Railway and Marine World."

The Montreal Harbor Commissioners propose to expend about \$300,000 on railway equipment during this year.

The Board of Railway Commissioners' Judgment in the Western Rate Case.

Western freight rates, in one form or another, have engaged the attention of the Board of Railway Commissioners since its inception in 1904. The complaint of the Vancouver Board of Trade, in the Coast Cities Case, alleging discrimination, was preferred before Commissioners Blair and Mills on Aug. 25, 1904. It was again brought up in another form in Oct., 1909, supplemented by an application of the British Columbia Government. The Winnipeg Board of Trade, on Nov. 14, 1911, passed a resolution alleging that the tolls of western lines were both unreasonable and discriminatory, and forwarded it to the Minister of Railways. This was referred to the Board of Railway Commissioners on Dec. 4, 1911. On Jan. 8, 1912, the late Chief Commissioner, J. P. Mabee, and his fellow commissioners determined that a full inquiry was necessary as to the reasonableness of the freight tolls, and placed upon the railways the onus of justifying the discrimination alleged to exist. The whole progress of the inquiry involved 62 hearings, taking up 100 days, at every important point from Port Arthur to Victoria, besides Montreal, Toronto and Ottawa; 72 witnesses were examined; 158 exhibits containing 4,870 pages were filed; and 6,148 pages of evidence were taken down.

The cases of the Vancouver and Victoria Boards of Trade and the B.C. Government were handled by W. A. McDonald, K.C., and C. G. McPhillips, K.C., assisted by the Vancouver Board of Trade's Traffic Officer and Mr. Calderhead, Statistician to the Washington State Commission. M. K. Cowan, K.C., ex M.P., represented Alberta and Saskatchewan, Alex. MacDonald, of Winnipeg, preparing his traffic exhibits. The Winnipeg Board of Trade engaged the services of Isaac Pitblado, K.C. The Dominion Government was represented by Jas. Bicknell, K.C., of Toronto; R. W. Whitla, K.C., of Winnipeg, and F. A. Morrison, K.C., of Alberta, assisted by Mr. Carpenter, Traffic Officer of the Winnipeg Board of Trade, and Mr. Muller, formerly Statistical Officer of the Interstate Commerce Commission, as experts in traffic matters. The C.P.R. was represented by its Chief Counsel, E. W. Beatty; F. H. Chrysler, K.C., of Ottawa, who conducted the case, and W. N. Tilley, K.C., of Toronto; the Canadian Northern by its Chief Counsel, F. H. Phippen, assisted by F. A. Anderson, of Winnipeg; the Grand Trunk Pacific by its Chief Counsel, W. H. Biggar, K.C., and Mr. Lafleur, K.C., of Montreal.

The case was hardly under way when the death occurred, in May, 1912, of Chief Commissioner Mabee. His successor, H. L. Drayton, K.C., was appointed in July, 1912, and some delay naturally ensued until he became familiar with the material that had been presented. Hearings from that date were held whenever possible, the last on Dec. 11, 1913. Making allowance for the Christmas season, the commissioners were but little over three months in reviewing the immense mass of statistics, accounts, evidence and argument, and reaching a conclusion thereon.

The judgment, which was delivered on April 7, covers some 200 pages and deals with each contention in order. It refers frequently to the report of the Board's Chief Traffic Officer, Jas. Hardwell, and attaches his examples of reductions ordered. The following is an official summary of the judgment:—

On account of the different interests concerned, the conflicting evidence, the number of hearings, and the importance of the subject, there is set out at length a history

of the application. The first step leading up to the inquiry was the resolution of the Winnipeg Board of Trade, on Nov. 14, 1911. This resolution was forwarded to the Government, and the matter was referred to the Board for action. There was at the same time pending a complaint of the Vancouver Board of Trade that the existing rates from eastern points on a western movement were discriminatory as compared with rates from Vancouver on an eastern movement. The Vancouver complaint, being bound up with and affecting the question of western rates, was joined in the Board's order of Feb. 15, 1912, with the general investigation of rates in Manitoba, Saskatchewan and Alberta, and in Ontario west of and including Port Arthur, which had been provided for in its order of Jan. 8, 1912.

It is unfortunate that an issue has been made between the east and the west. Cash payments or credits from the east in aid of railway development do not justify higher rates in the west. The opening up of the west by railway construction is of value to the east. The lower the rates in the west, the greater the extension of eastern business therein. The lower the rates in the east, the lower is the rate charge on which western goods find their way into the world's market. It is contended that the existing rates in the east are made possible by the excessive rates in the west. An analysis of this points out that the C.P.R. first commenced its operation in the west; that its main line was opened May 26, 1887; and that when it commenced its operation east of Fort William, it simply adopted the rates charged by other railways in that territory, and the rates so adopted were not affected in any way by the rates west of Fort William. No voluntary benefaction by way of reduction of rates was made to the people in the east at the expense of the people in the west.

In an attempt to ascertain whether the existing rate structure was inordinately profitable, the earnings of the C.P.R. were apportioned between its operating divisions on the basis of the mileage contained therein. It is recognized that in so dividing revenues between the eight operating divisions of the C.P.R., results are arrived at which are not characteristic. For example, the Lake Superior Division, which originates or terminates practically no traffic, is shown with a large proportion of revenue. As was pointed out by M. K. Cowan, K.C., the railway operating divisions are not the proper basis for distribution of revenue, because, for example, the provincial boundaries of Saskatchewan and the boundaries of the railway operating division of Saskatchewan are not the same.

The judgment makes a lengthy and careful consideration of the legislative provisions in regard to discrimination, setting out the provisions of the Railway Act which bear upon this matter. The Railway Act does not forbid all discriminations and preferences; it forbids an unjust discrimination or an undue preference. The Board has recognized in various decisions that the question whether discrimination is unjust or a preference undue is a matter of the particular facts of a particular case. Examples are cited. Group rates, while they have some elements of discrimination, are in the public interest so long as the discrimination is not unjust. Water competition has been recognized as a factor affecting rates. The Board has held that it is in the discretion of the railway whether it shall or shall not make rates to meet the competition of markets. A similar

position has been taken by the English Railway and Canal Commission. The Board has recognized that a division of the through rate is not a necessary measure of the reasonableness of the local rate. Special rates, such as those contained in town tariffs, and commodity rates, result in some discrimination. The commodity tariffs, under which the large bulk of the country's merchandise moves, work a two fold discrimination. In the first instance, a discrimination in favor of shippers of a particular class of merchandise from points where the volume moving justifies commodity rates as against shippers of the same commodity at points where no commodity rates exist; and, secondly, a discrimination in favor of an article carried at the commodity rates as against articles of a kindred nature which might come more or less into competition with an article moving under a commodity rate. But the low commodity rate basis works to the advantage not only of the shipper but also of the consumers. The effect of a town tariff is to give the advantage to a distributing centre as against similar stations within the area in which goods are distributed under the town tariff scale. While, theoretically, it might be proper to do away with town tariffs, it appears for the present that it would be contrary to public interest to interfere with the principle of town tariffs under which many distributing centres, particularly in the west, have been able to meet the competition of the well established distributing centres in the east. No doubt other distributing centres will spring up and make use of the town tariffs, when an economical distribution of merchandise seems to demand such centres.

It being recognized that the rates west of Fort William are higher than those east, the question of the factors affecting eastern rates has to be considered. In the territory extending from Windsor and Sarnia to eastern ocean ports, there is real and effective railway competition of United States lines. This competition was recognized by the Board in the International Rate Case. Water competition is effective throughout Eastern Canada as far as Port Arthur and Fort William. The low rate basis brought about by the lake transportation facilitates the movement of commodities into and out of the west. Counsel for Saskatchewan and Alberta recognized the existence of water competition at certain points, but disputed its efficiency at points some distance more remote from the railway. He recognized that the water competition might either be actual or potential, and that the water rate may hold down the combined lake and rail rate. It may be pointed out that the rate from the east to Winnipeg is influenced to a considerable extent by the water rates to the head of the Lakes.

The C.P.R.'s Atlantic Division is shown by the returns to be unprofitable. The rates in the Maritime Provinces are low, not only as a result of water competition, but also as a result of the Intercolonial rates, a road whose operations have largely resulted in deficits. The earnings of this division, on the mileage basis, are also held down by the fact that a large part of the business is through traffic carried on a low rate. In the case of a grain movement from Regina to St. John on a through rate, the Atlantic Division may be apportioned a part of the through rate proportioned to the mileage moved by it within this division. If the basis of the rates on western products to St. John were applied to the local traffic of the Atlantic Division, the local rates would

be very greatly depressed. From Woodstock, N.B., to St. John, for instance, the company would receive on a grain or flour shipment on the Regina basis only one-sixth the local tariff rate. The through rates keep down the average earnings. The Atlantic Division is in reality to be regarded as a terminal. The result is that the western provinces, producing as they do grain and flour, and interested as they are in a cheap furtherance rate, not only from their own borders but also to the seaboard, instead of being injured, participate in the benefits of the low through rates on grain and flour passing through this division.

So far as New Brunswick and Nova Scotia are concerned, no argument whatever was advanced denying the existence of water compelled rates. So far as Ontario is concerned, exception was taken to certain points only. By far the greater part of railway business in Eastern Canada is on the line of water competition. The rate basis in Eastern Canada, both adjacent to and more remote from the waterways, was established by the railways at a time when there was no regulation of rates. The rate basis they put in was affected both by water and by U.S. rail competition. Mr. Muller, the expert called by counsel for the Dominion Government, pointed out the effect of U.S. rail competition in connection with C.P.R. traffic in Eastern Canada. Mr. Calderhead, an expert of the Public Service Commission of the State of Washington, stated in evidence that the rates between New York and Chicago are influenced both by rail and water competition, and that the effect of water competition of the Great Lakes is operative at St. Paul, 149 miles inland. No evidence has been submitted by any of the complainants negating the force either of water or of railway competition in the east, or the resultant effect of such competition. The Board is of opinion that while discrimination exists between the rates charged east and west of Port Arthur, the discrimination is justified under the Railway Act and the decisions of the Board; that is to say, it is not an unjust discrimination or an undue preference. In the main, the rate structure of Eastern Canada is justified on the basis of water and railway competition. There may be some points where discrimination which cannot be justified by competitive reasons exists. It may be that in connection with these there would be justification for increase of rates.

An examination of the different tariffs east of Fort William voluntarily put in by the railways or ordered by the Board since Dec. 1, 1904, has been made. The important changes are set out at length in the judgment. The analysis of the changes made by the Board's orders in rate matters in the east shows that these have been almost wholly concerned with the abuses flowing from undue discrimination. The Board's order in the International Rate Case resulted in a general revision of class rates in Eastern Canada. This was concerned entirely with the removal of existing discriminations under which the shipper in the Western States could use the Canadian lines at a proportionately much lower rate than the Canadian shipper could. The result of the order was to recognize the water competition between U.S. rail carriers and water carriers which brought about the Detroit rate, and, further, to recognize the general effect of this water competition throughout the Canadian territory east of Detroit. The analysis of the tariffs shows that the railways have been desirous of raising the rates wherever possible. The rates in Eastern Canada may be low; perhaps at certain points too low, even in view of its geographical advantages. It cannot fairly be said, however,

that these low rates are in any manner the result of excessive western rates. They are practically the rates which applied long before the profits of western railway operations had anything to do with Canadian railway resources.

The existing railway mileage in Western Canada is inadequate, at least so far as Saskatchewan and Alberta are concerned. To ascertain to what extent the existing railway mileage meets the needs of Western Canada, calculations have been made to show how much acreage in these provinces is more than 10 miles from the railway. Complaints made to the Board by farmers in the west show that, on the average, a 10 mile haul enables the farmer, where there are fair roads, to market his grain and return home in one day. Railways laid out, having in view a maximum 10 mile haul, would not be constructed nearer to each other through the farming territory than 20 miles. On this computation, the railways existing in Saskatchewan serve 70,000 square miles, or 44,000,000 acres on the basis of the 10 mile haul. South of Township 58, there is an area of 121,000 square miles, or 77,000,000 acres, thus leaving 51,000 square miles or 32,000,000 acres yet to be served. Railways which may be constructed under the guarantees of the Province outstanding last year, when completed, would provide facilities for 17,000,000 additional acres. This would leave in the territory south of Township 58, 39% of the total acreage further than 10 miles from the railway. In Alberta, within the boundaries formed by Township 74 and Range 10 of the West Meridian, there are about 85,000,000 acres. In this acreage, existing railway lines serve 26,000,000 acres, on the basis of the 10 mile haul, leaving over 58,000,000 acres yet unserved. Railways proposed to be constructed under the guarantees of the Provincial Government and outstanding last year will provide for about 17,000,000 acres more, leaving 48% of the territory so referred to further than 10 miles, at least, from any railway. Complaints have been received by the Board that farmers living at a distance of from 18 to 35 miles from the railway spend, on getting the grain to the railway station, more than it costs to take it from the railway station to Fort William. The farmers of Mervin district, Sask., furnished information which showed that grain was hauled into Edam, 35, 40, and 45 miles; that on a 14 mile haul from Mervin to Edam, allowing \$5 a day for teams and proper allowances for expenses on the way, the cost of haulage was 20c. a bush.; that on a 35 mile haul, a smaller load had to be taken and the round trip required from two to three days, making the cost of marketing about 32½c. a bush.; that is to say, farmers hauling a distance of 35 miles to Edam, with a load of 40 bush., were at an expense of 32½c. a bush. to get it to the station, while from Edam to Fort William, 1,046 miles, the rate was 14 4-10c. a bush. A petition signed by 390 farmers of Eagle Creek district, Sask., showed that a large amount of grain taken out from the district necessitated a two days haul, and the cost of getting the grain to the station was 25¼c. a bush., as against a rate of 13c. a bush. from the station to Fort William, 939 miles. The cost of haulage on earthen roads runs from 20c. to 25c. a ton per mile. From the standpoint of the necessity for railways, the activity of the provincial governments in assisting railway construction, with a view to shortening the average haul of the farmers, appears well justified. Mr. Pitblado, for the Winnipeg Board of Trade, argued that the construction of such lines is in the first instance unremunerative, and that this accounted for the Canadian Northern returns not being satisfactory. Mr. Cowan took the same position. At the same time,

it must be recognized that the bulk of the C.N.R. branch line mileage within Saskatchewan and Alberta has been made at the direct request of the provincial governments, and with their financial support.

Railway extension is of immediate interest to the distributing centres of the west, as every addition to the railway network widens the consuming area. On the other hand, the farmer who already has railway facilities is not interested in the providing of them for competing farmers. Extensions into new territory should be made at the risk of the company rather than at the expense of shippers on the old lines. At the same time, consideration must be given to the necessity of enabling railways to obtain additional capital. Extensions of service, betterment of facilities, and the enlargement of terminals have from time to time to be met often in the old settled districts of the country. As a matter of public policy, railway rates should be rates of such a character as to attract investment and to render the railway securities marketable.

Counsel for the Dominion Government pointed out that regulations of rates, without adequate control of future railway development, would likely lead to the duplication of mileage. Mr. Pitblado also stated there was too much paralleling of railways in the west. The situation in respect of the location of railway mileage in the west has been examined into. It is recognized that a certain amount of overlapping will have to take place on account of the lines making grades, the question of physical conditions, and the matter of access to the large centres of population. It does appear that in Manitoba, taking that portion lying south of Township 19, Lake Manitoba, and Township 14, as far east as Selkirk, that there are 2,850 miles of track, while 2,000 in this area would be sufficient to place railways within 10 miles of every farmer; that is to say, there is 40% more mileage than the territory requires on the 10 mile basis. The conditions in Saskatchewan show, by dividing the territory into blocks, the following results:

Territory east of the 3rd Meridian and south of the northern boundary of Regina and Saltcoats Districts—Area, 110 by 144 miles. Total mileage, 2,622. Total mileage required to cover territory at 10 mile distance, 2,400. Total duplication, that is where lines are within 20 miles of each other, 850, or about 33%.

Territory in Saskatchewan north of Regina and Saltcoats Districts, and east of the 3rd Meridian and south of the south boundary of Township 41—Area, 192 by 96 miles. Total mileage, 847. Total mileage required to cover territory, 1,700. Total duplication, that is where lines are within 20 miles of each other, 193, or 23%.

Territory north of south boundary of Township 41, east of 3rd Meridian and south of Township 51—Area, 180 by 80 miles. Total mileage, 306. Total mileage required to cover territory, 1,120. Total duplication, that is, where lines are within 20 miles of each other, 50, or 16%.

Territory between 3rd and 4th Meridian, and south of the south boundary of Township 24—Area, 180 by 138 miles. Total mileage, 430. Total mileage required to cover territory, 2,000. Total duplication, that is where lines are within 20 miles of each other, 36, or 9%.

Territory between 3rd and 4th Meridians and the south boundary of Township 51 and the north boundary of Township 23—Area, 168 by 162 miles. Total mileage, 1,656. Total mileage required to cover territory, 2,800. Total duplication, that is where lines are within 20 miles of each other, 302, or 18%.

Similar computations, by districts, in the

case of the Province of Alberta, give the following results:

District of Victoria—Total mileage, 166. No duplication.

District of Strathcona—Total mileage, 554. Total duplication, that is where lines are within 20 miles of each other, 111, or 20%.

District of Red Deer, east of east boundary of Range 8, West 5th Meridian—Area, 210 by 75 miles. Total mileage, 684. Total duplication, that is where lines are within 20 miles of each other, 138, or 20%.

District of Calgary—Total mileage, 357. Total duplication, that is where lines are within 20 miles of each other, 110, or 30%.

District of MacLeod—Total mileage, 384. Total duplication, that is where lines are within 20 miles of each other, 110, or 29%.

District of Medicine Hat—Total mileage, 746. Total duplication, that is where lines are within 20 miles of each other, 115, or 16% of the constructed lines.

In British Columbia there is the paralleling of the Canadian Northern and Canadian Pacific, while in Western Alberta there is the paralleling of the Canadian Northern and the Grand Trunk Pacific. It is recognized that paralleling also exists east of Fort William. No opinion is expressed as to how much of this duplication was or was not necessary. Mr. Pitblado's criticism is, in part at least, well founded, and the necessity for some business control by the Government which will prevent unnecessary duplication of facilities is established.

Which, if any, of the three lines, Canadian Pacific, Canadian Northern, and Grand Trunk Pacific, should be taken as a typical line? It is impossible for the Board to deal with rates in the west on the hypothesis that the C.P.R. is the only railway which should be taken into consideration; nor can it be held that the only measure of what rates should be is to be found in the position occupied by the C.P.R. Counsel for the Dominion Government expressed the wish that the Board would so reduce rates, taking the C.P.R. as a standard road, as not to injure other lines. He was unable to suggest how that end could be accomplished, nor was this to be wondered at, as, beyond all question, rates based on the C.P.R.'s power to stand reductions would inevitably bankrupt not only both the Canadian Northern and the Grand Trunk Pacific, but for the future preserve the western provinces to that company in so far as any new companies or new lines were concerned. It would be impossible for any ordinary company to live in competition with the C.P.R. under such conditions. The rates must be considered having regard to the traffic necessities of Western Canada and a fair return to the carrier, apart entirely from any question of reserves of the company on the one hand or liabilities of the company on the other. The matter must be dealt with from the standpoint of the principle laid down by the late Chief Commissioner, J. P. Mabee, who, at the outset of the inquiry, laid down the line of action in the following words: "With reference to the inquiry into the financial standing of the companies, it seems to me that if one is to be investigated they should all be investigated. We should not be submitted to the possibility of prejudice in settling these rates by placing before our eyes the millions and millions of treasure that the C.P.R. is supposed to have hoarded up. The question for us to decide is what rates are fair irrespective of how much any company is worth or is not worth."

The Board must take the existing railway mileage as it finds it. It was suggested that Parliament had not shown due care in chartering railways, or in allowing them to be constructed. The Board has had nothing to do with the steps whereby additional

railway mileage came into existence; and it is not in any way concerned with the question of whether or not a railway was constructed from the standpoint of political expediency, and expresses no judgment thereon.

Counsel for the Dominion Government presented as a basis for rate making a method whereby average costs might be ascertained. As explained by the expert, Mr. Muller, it is not concerned with specific or actual costs. An attempt is made to distinguish terminal charges from road haul charges. The terminal charges as well as the road haul charges are computed on a series of averages requiring the use of very complicated statistical methods. In dealing with the apportionment of expenses between freight and passenger business, Mr. Muller uses nine different methods of statistical apportionment. The statistical averages of the cost of road haul movement as computed depend on the averaging of high grade and low grade, long haul and short haul traffic. Neither the road cost nor the terminal cost so worked out is claimed to be in accordance with actual costs. All that is claimed is that it is an average. It is suggested that the cost so averaged out will, by the addition of a proper percentage to cover capital charges, afford a proper basis for the making of rates. The method which he advocates has never had a thorough going practical test as a basis of rate making. The Interstate Commerce Commission has not yet been able to work out, with its large statistical force, a satisfactory system based on cost. It has further stated that cost estimates of the kind in question cannot be relied upon as decisive factors. A portion of the C.P.R.'s present revenue is due to its having a through line, while the Canadian Northern and Grand Trunk Pacific are not yet in this position. With the opening up of the through lines of the two latter railways, not only will they share in the through business but business which they are at present handing over to the C.P.R. will be handled by them. But Mr. Muller says that to work out rates based on his system a five year period should be taken for comparison, and that the rates so worked on his basis should be revised every five years. However, with the change brought about by the opening up of the Canadian Northern and Grand Trunk Pacific through lines, rates based on the C.P.R.'s past performance would have no proper application to the new conditions arising. While recognizing the statistical ingenuity of the theory, it must at the same time be recognized that this

plete rate structure for all railways in Western Canada subject to its jurisdiction. The territory west of the Great Lakes is divided into three sections. The first is called the Prairie Section, extending from the Great Lakes to the Mountains; the second the Pacific Section, including mainland rail lines in British Columbia; and the third the B.C. Lakes Section, including the inland navigable waters in that Province. A standard scale of maximum freight rates is fixed for each section. The lowest scale in the west, now known as the Manitoba standard, has been amplified to show rates up to 2,100 miles, and will apply throughout the entire Prairie section and on the British Columbia Lakes, abolishing the higher scale now charged in Saskatchewan and Alberta. What will be known as the Pacific scale is on a somewhat higher basis and will govern in Pacific territory. These changes result in substantial reductions from the present standard maximum scales in Saskatchewan, Alberta and British Columbia.

Special distributing tariffs on a lower basis are authorized from recognized distributing centres, the reduction from the standard tariff of each territory being 15% of the prairie standard scale. The following first class rate examples indicate the character of the reductions, the other classes being proportionately scaled. The 1st class rate from Winnipeg to Regina is reduced by 8c.; to Swift Current by 9c.; Calgary, 12c.; Revelstoke, 15c.; Saskatoon, 13c.; Edmonton, 16c.; Lethbridge, 10c. per 100 lbs. From Regina the 1st class rate is reduced to Broadview by 3c.; to Swift Current, 6c.; Medicine Hat, 7c.; Colonsay, 13c.; Saskatoon, 6c.; and Wilkie, 18c. per 100 lbs. From Saskatoon the 1st class is reduced to Hardisty by 7c.; Wynyard, 4c.; Davidson, 4c. per 100 lbs. From Calgary to Regina, 10c.; Macleod, 3c.; Edmonton, 4c.; Lethbridge, 3c.; Cardston, 4c.; Fernie, 8c. per 100 lbs. From Edmonton to Saskatoon, 4c.; Camrose, 6c.; Wetaskiwin, 6c.; Calgary, 4c.; High River, 7c.; Lethbridge, 9c. per 100 lbs. Similar reductions are made from other prairie jobbing centres. From Vancouver to Ashcroft, 14c.; Kamloops, 20c.; Revelstoke, 26c.; Nelson, 15c.; Calgary, 7c. per 100 lbs.

Through rates from Eastern to Western Canada are based on those charged from Port Arthur or Fort William. After citing reductions already made by the Board in the Regina Rate Case, further reductions are made and a more uniform basis adopted. Examples of the new rates from the Lake Terminals are given below, those to other points being similarly scaled:—

Classes.	1	2	3	4	5	6	10
To Winnipeg—	86	72	57	42	38	34	20
Old rates	85	71	56	42	38	32	19
New rates	154	129	102	77	68	59	34
Regina—	146	122	98	73	65	56	33
Old rates	159	132	106	79	71	61	35
New rates	153	128	102	77	69	60	35
Moose Jaw—	224	186	149	112	102	90	52
Old rates	213	178	142	106	95	85	49
New rates	175	146	116	87	78	68	40
Calgary and Edmonton—	164	137	110	82	74	64	37
Old rates	215	179	142	107	96	85	49
New rates	201	167	133	100	90	79	46
Saskatoon—	303	253	202	153	140	133	73
Old rates	251	209	167	126	115	104	61
New rates							

theory has never had a practical test under such conditions as are present in this inquiry. There would be many difficulties in applying it, nor can it be said how it would work out. What is needed is a practical working method. With due consideration of all the factors concerned it does not appear how any practical application can in the present instance be made of this theoretical project for a new system of rate making.

After dealing with various arguments of counsel, the judgment proceeds to outline a comprehensive basis of tolls and a com-

Local grain and flour rates are substantially reduced by two methods, first by a direct reduction ranging from 20 to 30%, and secondly by making the terminal Fort William rates the maximum that may be charged between intermediate stations. For example, Broadview to Winnipeg, now 20c., becomes 15c. per 100 lbs.; and Calgary to Winnipeg, now 43c., through the application of the Fort William rate as maximum, becomes 24c. The westbound rates on flour and other grain products are similarly reduced. This is an endorsement of the complaint of the United Farmers of Alberta,

and the application of the Winnipeg Board of Trade. The United Farmers of Alberta also win in their application for reduced rates on these products to British Columbia stations.

Coal rates from Lethbridge and other Alberta mines are substantially cut; for example, from Lethbridge to Calgary from \$1.80 a ton to \$1.45; to Edmonton from \$2.85 to \$2.20; Swift Current, \$2.40 to \$1.90; Regina, \$3.10 to \$2.65; Virden, \$4.10 to \$3.40; Saskatoon, \$3.95 to \$3.30 a ton. From the Souris mines, reductions made by the Board in the Alameda case are confirmed and others made. Thus, from Estevan to Brandon from \$1.70 to \$1.40; to Carberry, \$1.90 to \$1.50; Emerson, \$2.30 to \$2.00; Rapid City, \$2 to \$1.60; Swift Current, \$2.15 to \$1.70; Colonsay, \$2.40 to \$1.80; Saskatoon, \$2.60 to \$2.10; Yorkton, \$2.80 to \$2.20. From Merritt, B.C., to Yale, from \$1.80 to \$1.65; to Kamloops, from \$2 to \$1.75; to Sicamous, from \$2.50 to \$2.20; to Penticton, from \$3.30 to \$2.90; to Nelson, from \$4.10 to \$3.65.

Carload sugar rates from Raymond, Alta., to prairie points also receive attention, Lethbridge being reduced from 11c. to 9c.; Cranbrook, 42c. to 38c.; Nelson, 60c. to 51c.; Calgary, 31c. to 23c.; Edmonton, 42c. to 37c.; Regina, 50c. to 42c. per 100 lbs. The special mileage rates on butter, cheese and eggs, dressed meats and dressed poultry between all prairie points come in for reductions. The special mileage tariffs on vegetables in Manitoba are shown to be reasonable; the rates, however, in Saskatchewan and Alberta, which are on a somewhat higher scale, are reduced to the Manitoba basis. The special rates on fruits and vegetables from British Columbia, which have been revised and reduced since the complaint against them by the United Farmers of Alberta, are left untouched. The rates on cement from Winnipeg are shown to vary little from those of Ontario, and are not reduced, but the higher rates from cement plants in Alberta and Saskatchewan are reduced to the Winnipeg scale. Lumber and joiners' work from British Columbia to prairie destinations have been already reduced following the Board's order in July, 1913. A table showing some of the reductions accompanies the judgment. The rates on sugar from Vancouver remain unchanged, the complaint of the British Columbia Sugar Refinery not being sustained. No reduction is made in livestock rates, which are shown to be reasonable in view of the favorable carload minimum weights and the volume of traffic. The rates on fence posts, firewood, brick, stone, gravel and sand are found to be generally lower than those applying in Ontario; but the higher scales prevailing in Alberta and Saskatchewan are reduced to the lower Manitoba basis. Rates on ores, concentrates, and smelter products, in and from British Columbia, are found to constitute a large percentage of the traffic of that Province, and are found remunerative only in the sense of contributing to the general prosperity. The rate on pig iron from Port Arthur and Fort William to Winnipeg is reduced from 20c. per 100 lbs. to \$3 per gross ton.

A review of the judgment shows that the whole structure of western rates, starting from the standard maximum mileage scale, the class tariffs from Lake Superior and Pacific Coast terminals, the class distributing rates, commodity tariffs applying on grain, coal, livestock, cement, fruit, vegetables, brick, sand stone, lumber, dairy products, etc., have been closely inspected and definite decisions given in connection with each.

The Board has considered the question of local passenger rates in British Columbia very carefully. It finds that the local pas-

senger business is being conducted at a loss. It, therefore, does not feel justified in directing any change until it is afforded an opportunity of seeing what improvement in passenger revenues will result from the improvement in railway grades and operating facilities which the railway is at present making.

Owing to the large amount of space which had to be devoted to the foregoing matter, the usual summaries of all orders passed by the Board, and the completed traffic orders have had to be omitted, but will appear next month.

Railway Rolling Stock Notes.

The G. T. R. has received 400 box cars from Eastern Car Co., and 10 box cars from Western Steel Car and Foundry Co.

The G. T. R. has ordered 1 dining car and 1 parlor buffet car from Canadian Car and Foundry Co.; and 2 dining cars and 1 parlor buffet car, from Pullman Co.

The Pacific Great Eastern Ry. has ordered one 250 h.p. passenger motor car from California, and 3 trailer cars from Canadian Car and Foundry Co.

The Canadian Northern Ry., between Mar. 13 and Apr. 13, received 7 first class cars from Canadian Car and Foundry Co., and 2 consolidation locomotives from Canadian Allis Chalmers, Ltd.

The C. P. R., between Mar. 15 and Apr. 15, received the following additions to rolling stock,—39 steel frame box cars, and 1 steel colonist car, from its Angus Shops; and 149 steel frame box cars, from Canadian Car and Foundry Co.

The Imperial Oil Co., Sarnia, Ont., has ordered 100 tank cars, underframes and trucks, 40 tons capacity, and 10 three compartment tank cars, underframes and trucks, 30 tons capacity, from Canadian Car and Foundry Co., for delivery during May.

The Pacific Great Eastern Ry. has ordered 3 cabooses, 3 refrigerator cars, 5 stock cars and 10 all steel ballast cars, from National Steel Car Co.; 3 steel passenger cars from Canadian Car and Foundry Co., and one gasoline motor car in San Francisco, Cal.

The Dominion Parliament has voted the following amounts for rolling stock, etc., for the Canadian Government Railways:—Rolling stock, \$166,666.66; safety appliances, \$2,333.33; to improve triple valves on airbrakes, \$1,191.67; electric equipment for charging electric lighted cars, \$166.67.

The Canadian Engineer of Apr. 16 announced that a contract had been awarded by the C. P. R. to the "New Glasgow Car Works" for the construction of 180 steel cars. We were officially advised by the C. P. R. management Apr. 22 that no such order had been placed.

The Intercolonial Ry. has received the following additions to rolling stock,—143 box cars, 60,000 lbs. capacity, from Canadian Car and Foundry Co.; 14 vans, from Nova Scotia Car Works; 4 first class cars, from Preston Car and Coach Co.; 4 consolidation locomotives from Canadian Locomotive Co., and 2 consolidation locomotives from Canadian Allis Chalmers, Ltd.

The Canadian Car and Foundry Co., during March, delivered the following rolling stock,—Canadian Northern Ry., 10 first class cars; C. P. R., 259 steel frame box cars; Cape Breton Coal, Iron and Ry. Co., 5 fifteen ton wood hoppers; Dominion Coal Co., 25 fifteen ton wood hoppers; Intercolonial Ry., 165 thirty ton steel frame box cars, and Montreal Tramways Co., 10 steel underframe street cars.

The Edmonton, Dunvegan and British Columbia Ry. has ordered one mogul (2-6-0) locomotive from Canadian Locomotive Co. Following are the chief details,—

Weight in working order on drivers, 112,800 lbs.
 Weight in working order, total . . . 129,500 lbs.
 Wheel base, rigid 12 ft. 6 ins.
 Wheel base, engine, total 20 ft. 6½ ins.
 Wheel base, engine and tender, 49 ft. 3¼ ins.
 Heating surface, firebox 133 sq. ft.
 Heating surface, tubes 1,301 sq. ft.
 Heating surface, total 1,434 sq. ft.
 Driving wheels, diar. 50 ins.
 Driving wheel centres Cast iron.
 Driving journals 8½ by 12 ins.
 Cylinders, diar. and stroke 19 by 26 ins.
 Boiler, type Extended wagon top.
 Boiler pressure 180 lbs.
 Tubes, no. and diar. 240-2 ins.
 Tubes, length 10 ft. 5¼ ins.
 Injectors Two, locomotive type.
 Safety valves Two 3 ins.
 Brakes Westinghouse.
 Packing Metallic.
 Weight of tender, loaded 115,400 lbs.
 Tank capacity 5,000 imp. galls.
 Fuel capacity 9 tons.
 Truck, type 4 wheeled arch bar.
 Wheel, diar. Cast iron, 33 ins.
 Journals 5 by 9 ins.
 Brake beam Steel.

The City of Winnipeg has ordered one mogul (2-6-0) locomotive from Canadian Locomotive Co., in connection with the construction of its new water supply system. The price is \$13,400. Following are the chief particulars,—

Weight on drivers 113,000 lbs.
 Weight, total 130,000 lbs.
 Wheel base, rigid 12 ft. 6 ins.
 Wheel base, total 20 ft. 6½ ins.
 Wheel base, engine and tender 49 ft. 3¼ ins.
 Heating surface, firebox 133 sq. ft.
 Heating surface, tubes 1,301 sq. ft.
 Heating surface, total 1,434 sq. ft.
 Driving wheels, diar. 50 ins.
 Driving wheel centres Cast iron.
 Driving journals 8½ by 12 ins.
 Cylinders, diar. and stroke 19 by 26 ins.
 Boiler, type Extended wagon top.
 Boiler pressure 180 lbs.
 Tubes, no. and diar. 240-2 ins.
 Tubes, length 10 ft. 5¼ ins.
 Injectors Two locomotive type.
 Safety valves Two 3 ins.
 Brakes Westinghouse.
 Packing Metallic.
 Weight of tender loaded 115,400 lbs.
 Tank capacity 5,000 imp. galls.
 Fuel capacity 9 tons.
 Truck, type 4 wheeled arch bar.
 Wheel, diar. Steel tired, 33 ins.
 Journals 5 by 9 ins.
 Brake beam Steel.

Following are chief details of the 10 Pacific (4-6-2) type locomotives, class S246 and S247, which the Intercolonial Ry. has ordered, from Montreal Locomotive Works, as mentioned in our last issue,—

Cylinders, diar. and stroke 23½ by 28 ins.
 Tractive power 32,400 lbs.
 Factor of adhesion 4.86
 Wheel base, rigid 13 ft. 0 ins.
 Wheel base of engine, total 33 ft. 10 ins.
 Wheel base, engine and tender 66 ft. 6¾ ins.
 Weight, total 247,100 lbs.
 Weight on drivers 157,600 lbs.
 Weight on trailers 45,000 lbs.
 Weight on engine truck 44,500 lbs.
 Weight, total, engine and tender 397,700 lbs.
 Boiler, type Straight top, radial stay.
 Boiler diar. first ring 72 ins.
 Boiler pressure 180 lbs.
 Firebox, length and width 108 by 75¼ ins.
 Tubes, no. and diar. 205-2 ins.; 28-5¾ ins.
 Tubes, length 20 ft. 6 ins.
 Heating surface, tubes 2,994.3 sq. ft.
 Heating surface, firebox 188 sq. ft.
 Heating surface, total 3,182.3 sq. ft.
 Superheating surface 691 sq. ft.
 Grate area 56.4 sq. ft.
 Cab vestibule C. P. R. style.
 Wheels, diar. Outside 73 ins.; centre 66 ins.
 Wheels, material, driving Cast steel.
 Wheels, engine truck

34 ins. w. i. centre, steel tire.
 Wheels, trailing, 48 ins.; c.s. centre, steel tire.
 Wheels, tender 36 ins.; w. i. centre, steel tire.
 Driving journals, main 10 by 13 ins.
 Truck journals 6½ by 12 ins.
 Trailing journals 8 by 14 ins.
 Tender journals 5½ by 10 ins.
 Journal boxes Cast steel.
 Brakes Westinghouse American.
 Engine truck Standard 4-wheel.
 Trailing truck Cole radial, outside journals.
 Grates, I. R. C. standard cast iron, operated by Franklin shakers.
 Water capacity 6,500 imp. galls.
 Coal capacity 12 tons.

Railway Finance, Meetings, Etc.

Atlantic and Lake Superior Ry.—A general meeting of holders of certificates of participation in the A. and L. S. Ry. trust funds was held in Montreal, April 25, to value the assets to be distributed in kind; to alter paragraph 42 of the constitution and regulations for the management of the fund, so as to permit a distribution among the different classes in the manner resolved upon by general and separate meetings held Dec. 6, 1910, and to make a total or partial distribution of the same, and further that separate meetings of the holders of preference, ordinary and deferred certificate holders will be held consecutively in the same place on the same day, to agree to the valuation of the assets. J. Degalindey is chairman of the committee of management.

Canadian Pacific Ry. Not Borrowing.—Sir Thos. Shaughnessy is credited with saying recently:—"The C.P.R. will have no need to borrow further money for some time to come. A great deal of money will be spent this year for construction purposes; yet we have a good deal of money in our treasury for this purpose. The C. P. R. has been spending more money on its lines than it has borrowed; but it always has the debenture stock to fall back upon, and there are plenty of people who will eagerly buy this up."

Grand Trunk Pacific Ry.—Tenders are under consideration for the purchase of ten blocks of land, comprising in all about 625,000 acres of land along the company's branch line between Fort William and Graham, Ont. This comprises the lands granted by the Ontario Legislature in respect of the construction of the line. G. U. Riley, Land Commissioner, Winnipeg.

Grand Trunk Ry.—At the ordinary general half yearly meeting of shareholders in London, Eng., April 29, resolutions were submitted assenting to and accepting two acts of the Dominion Parliament, entitled respectively the G. T. Act 1914, and G. T. and Canada Atlantic Amalgamation Act, 1914, and authorizing the directors to exercise the powers conferred by these acts.

Intercolonial Ry.—In presenting the report of the Department of Railways and Canals to the House of Commons recently, the acting Minister said it was estimated that the receipts for the year ended Mar. 31, would amount to \$12,632,973.17, and the estimated expenditure to \$12,328,000, leaving a net surplus of about \$300,000, which would be transferred to renewal of equipment account. This surplus was less than that for the financial year ended Mar. 31, 1913, but it was to be largely accounted for by the fact that there had been a large increase in the cost of operation during the first eight months of the year amounting in all to \$783,000. During the past fiscal year there had been added to equipment renewal account, \$300,000; to rail renewal account, \$150,000 and to fire renewal account, \$60,000. The average revenue per month had been \$1,066,914.43 against \$998,706.89 for the previous year; while the operating expenses averaged \$1,041,574.84, against \$998,831.87. The figures for February and March were estimated, and subject to revision.

Kingston and Pembroke Ry.—A duplicate original of an indenture made between W. F. Nickle, K. C., Kingston, Ont.; the K. and P. Ry. Co., and the C. P. R., dated Feb. 25, has been deposited with the Secretary of State at Ottawa. The document conveys to the K. and P. Ry. Co. the franchise, undertaking and all other property of the company, conveyed to R. V. Rogers under a trust deed dated Dec. 31, 1898. This is a

discharge of an old mortgage, and signalizes the final transfer of the line to the C. P. R.

Lake Huron and Northern Ontario Ry.—G. P. McCallum, President of the Lake Huron and Northern Ontario Ry., disclaims any knowledge of the Boston parties offering bonds of the Lake Huron and Northern Ontario Co., and says that they are making entirely unwarranted statements in connection therewith, and that many of the statements are absolutely untrue and unauthorized. He repudiates all knowledge of the circular letter which is accompanying the offering of the bonds and states that the company has not yet issued bonds or securities of any kind. This circular was the subject of a short debate in the Ontario Legislature recently. The leader of the Opposition read the article to the House, and drew the attention of the Minister of Lands, etc., to the charge that the company was claiming to have the guarantee of the province back of its bonds, and was booming its stock as another C.P.R. bonanza. He asked if the Minister was acquainted with the facts. Mr. Hearst promised to look into the matter, and at the night session read a letter from the company's solicitor in which he stated that no such prospectus as that alluded to had been issued by the company. The Minister promised to look into the matter further, and assure himself that no company, particularly one having any connection with the Government, was making improper representations.

Maritime Coal, Ry. and Power Co.—The annual meeting was held in Montreal, April 18, W. Hanson, President, in the chair. The net profits for the financial year were reported to be \$116,000, an increase of 16% over those of the previous year. It is proposed during this year to largely increase the plant at the collieries. The directors were re-elected, and the following officers were elected:—President, W. Hanson; Vice President, A. E. Dymont, Toronto; Secretary, R. Wilson, Jr.

New Brunswick Coal and Ry. Co.—The New Brunswick Legislature has passed an act providing for the issue of debentures amounting to \$212,175.54 bearing 4½% interest, for the purpose of providing for the liabilities of this railway. The line came under the control of the N. B. Government in 1908, and was taken over by the C. P. R. June 1, 1913. During that period the following deficiencies accumulated: Financial year 1909, \$30,000; 1910, \$48,919; 1911, \$66,000; to June 1, 1913, \$67,260.49. The deficiencies to the end of the financial year of 1911 were provided for by means of temporary loans, and that to June 1, 1913, by an overdraft. The balance of the amount of \$212,175.54 is made up of the amount of the Dominion Government's claim for rails and materials furnished to the company prior to the line being taken over by the N. B. Government. The act provides for the provision of a sinking fund out of the consolidated fund of the Province to meet the debentures at maturity.

New York Central Lines in Canada.—There has been deposited with the Secretary of State at Ottawa an agreement, supplemental to a lease dated April 23, 1912, between the Guaranty Trust Co. of New York, as trustee, and the New York Central and Hudson River Ry., the Lake Shore and Michigan Southern Ry., the Michigan Central Ry., and the Cleveland, Cincinnati, Chicago and St. Louis Ry., under the New York Central Lines Equipment trust of 1912, with respect to the rolling stock used on the company's lines in Canada.

Pere Marquette Rd. Bond Interest Default.—New York press dispatch, April 1:—"The Pere Marquette Rd. Co., now under receiv-

ership, defaulted in its semi annual interest on \$5,000,000 bond due today. J. P. Morgan and Co., who have been the fiscal agents of the road, said they made no interest payments, and other banking interests identified with the property know of no interest disbursements. The bonds under default are divisional issues of the old Flint and Pere Marquette Rd., \$1,000,000 of which bears 4% interest, and the remaining \$4,000,000 6%. The amount defaulted is \$140,000."

On April 2 foreclosure proceedings were started at Detroit, Mich., by the Farmers' Loan and Trust Co. of New York, which is said to hold \$2,850,000 of the bonds.

Lake Huron and Northern Ontario Ry.—A bond issue of \$1,000,000 is reported to have been placed on the New York and Boston markets. The company was voted a large area of land for colonization purposes by the Ontario Government, on condition that the old Bruce Mines and Algoma Ry., which was taken over, be extended to a junction with the National Transcontinental Ry. The attention of the Ontario Government has been called to statements made in the prospectus as to the value of the land grant, which is asserted to be \$8 an acre.

Prince Edward Island Ry.—The estimated earnings for the financial year ended Mar. 31, were stated recently by the acting Minister of Railways, in laying the report of the Department before the House of Commons, to be \$410,000, and the expenditure \$555,000. The deficit of \$145,000 is an increase over that for the financial year ended Mar. 31, 1913, and is due largely to the increased cost of labor and material.

Temiscouata Ry. Gross earnings for Jan., \$22,930; operating expenses \$18,904; net earnings \$4,026, against \$18,729.16 gross; earnings; \$14,877.36 operating expenses; \$4,851.80 net earnings, for Jan., 1913.

White Pass and Yukon Route. Gross earnings from Jan. 1 to Mar. 7, \$37,827, against \$47,689 for same period, 1913.

One of Sir William Whyte's Jokes.—"A Manitoba Free Press reporter discussed one day with the late Sir William Whyte the great number of claims preferred against the railway by reason of horses and cattle killed by trains. He remarked the peculiar fact that practically every animal killed figured in the claims as thoroughbred stock. 'Do you know,' said Sir William, 'I have reached the conclusion that nothing in this country so improves live stock as crossing it with a C. P. R. locomotive.'"

Moncton and Buctouche Ry.—We are officially advised that the railway extending from Moncton to Buctouche, N. B., 32 miles, is still being operated under the title of the Moncton and Buctouche Ry. The transfer of the line and other property to the Moncton and Northumberland Strait Ry., originally incorporated as the Buctouche Ry. and Transportation Co., has not been made.

Canadian Aviation Co., Ltd., has been incorporated under the Dominion Companies Act, with \$50,000 capital and office at Toronto, to build and deal in aeroplanes, hydroplanes, flying machines and air and water craft, and "to carry on the business of an aircraft navigation company." W. A. Dean, C. J. Hevey and W. J. and H. L. McCallum, Toronto, are among the incorporators.

C. P. R. Medical Service.—Arrangements have been completed for the establishment of a new plan for medical service on the C. P. R. lines in British Columbia, and a meeting of the employes was held at Revelstoke, April 17, for the purpose of adopting a constitution, electing officers, and placing the new system on a working basis.

Transportation Appointments Throughout Canada.

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

Alberta Central Ry. J. G. REID has been appointed Assistant Engineer, vice J. Grant MacGregor, who has been appointed Consulting Engineer. This line is a C. P. R. subsidiary.

Canada Steamship Lines, Ltd. W. J. KING has been appointed Agent at Montreal.

C. D. SECORD, heretofore master of the Pittsburgh Steamship Co.'s s. s. Rensselaer, has been appointed Assistant Superintendent, Toronto.

I. B. McCONNELL has been appointed Agent, Yonge St. Wharf, Toronto.

F. MITCHELL has been appointed storekeeper in charge of Toronto stores, Yonge St. Wharf, Toronto.

A. ROSS has been appointed Accountant, Passenger Steamers, Yonge St. Wharf, Toronto.

J. J. HENNIGAR, heretofore General Agent, Richelieu and Ontario Navigation Co., Hamilton, Ont., has been appointed Agent, Canada Steamship Lines, Ltd., there.

J. J. BURKE has been appointed Agent at Fort William, Ont.

Canadian Government Railways.—J. C. BECKWITH has been appointed Engineer of Construction, Intercolonial Ry. and Prince Edward Island Ry., vice H. M. Killaly, deceased. Office, Moncton, N. B.

Canadian Northern Ry. A. W. SYMES, heretofore Soliciting Freight Agent, Montreal, has been appointed Travelling Freight Agent, Toronto.

G. M. ARGUE, heretofore Car Foreman, North Battleford, Sask., has been appointed Car Foreman, Fort Frances, Ont., vice E. W. Winnebeck resigned.

R. B. McINTOSH, heretofore chief clerk, District Freight Office, Saskatoon, Sask., has been appointed chief clerk, General Freight Office, Winnipeg.

B. R. MARSALES, heretofore Contracting Freight Agent, Brandon, Man., has been appointed District Freight Agent, Regina, Sask.

A. BROSTEDT, heretofore District Freight and Passenger Agent, Great Northern Ry., Winnipeg, has been appointed Division Freight Agent, C. N. R., Calgary, Alta.

Canadian Pacific Ry. H. C. GRIFFIN has been appointed General Car Inspector, Eastern Lines, vice L. C. Ord, whose appointment as Assistant Master Car Builder, was announced in a recent issue. Office, Montreal.

J. AITKEN, heretofore Locomotive Foreman, Magantic, Que., has been appointed Locomotive Foreman, Sherbrooke, Que., vice C. W. Stackhouse transferred.

G. C. JACKSON has been appointed Auditor of Claims. Office, Montreal.

C. W. STACKHOUSE, heretofore Locomotive Foreman, Sherbrooke, Que., has been appointed Locomotive Foreman, Angus Shops, Montreal, vice W. Wood.

D. I. THORNTON has been appointed Shop Engineer, Car Department, Angus Shops, Montreal.

E. J. HARVEY has been appointed Assistant Shop Engineer, Car Department, Angus Shops, Montreal.

N. BERGER, heretofore Assistant Roadmaster at Farnham, Que., has been appointed Roadmaster, Farnham and Sherbrooke Subdivisions, Eastern Division, vice O. Kirkland transferred. Office, Farnham, Que.

J. H. DUFF has been appointed Chief Dispatcher, Farnham, Que., vice J. J. Morgan.

G. BRIMACOMBE has been appointed Locomotive Foreman, Sortin Yard, Montreal, vice W. Wood transferred to Angus Shops.

JAMES WEIR has been appointed Night Locomotive Foreman, Outremont, Que.

L. CLEARY has been appointed Assistant Locomotive Foreman, Outremont, Que.

C. E. SARNEY, heretofore Assistant Foreman, Outremont, Que., has been appointed Locomotive Foreman, Megantic, Que., vice J. Aitken transferred.

O. KIRKLAND, heretofore Roadmaster, Farnham and Sherbrooke Subdivisions, Eastern Division, Farnham, Que., has been appointed Roadmaster at Smiths Falls, Ont.

K. A. DUNPHY, heretofore Resident Engineer, Calgary, Alta., has been appointed Resident Engineer, Saskatoon, Sask.

E. B. SKEELS has been appointed Resident Engineer, Calgary, Alta., vice K. A. Dunphy transferred.

G. H. RAWLINS, Manager, Banff Springs Hotel, is reported to have been appointed Manager, Hotel Palisser, Calgary, Alta.

B. WILSON has been appointed storekeeper at Strathcona, Alta., vice G. M. Keates transferred to Mechanical Department.

C. BRADLEY has been appointed storekeeper at Coquitlam, B. C., vice J. H. Waters transferred.

P. H. WATERS, heretofore storekeeper at Coquitlam, B. C., has been appointed storekeeper at Vancouver, B. C.

A. G. G. LAUDER, heretofore Freight Agent, has been appointed District Freight Agent. Office, Milwaukee, Wis.

W. M. PORTEOUS, heretofore Freight Agent, has been appointed District Freight Agent. Office, St. Louis, Mo.

L. C. JACK, heretofore Freight Agent, has been appointed District Freight Agent. Office, Kansas City, Mo.

E. EDEN, heretofore Freight Agent, has been appointed District Freight Agent. Office, Omaha, Neb.

Chicago Great Western Ry. CHARLES A. FULLEN, heretofore General Agent, Fargo, N. D., has been appointed General Agent, Winnipeg, Man., vice Roy Bullen, resigned to enter G. T. R. service as announced in our last issue. Office, 195 Portage Ave. East.

Grand Trunk Pacific Ry. The following station agents have been appointed,—Justice, Man., J. E. Porter; Spy Hill, Sask., W. Thresher; Ituna, Sask., P. D. Hamilton; Young, Sask., J. T. Scott; Griffin, Sask., J. R. Wilson; Stoney Plain, Alta., D. J. Harnet; Bashaw, Alta., J. W. LeGallais; Battleford, Alta., R. L. Harrop; Coalspur, Alta., D. S. McCready; McBride, B. C., A. E. Robin.

Grand Trunk Ry. V. G. SNELL, heretofore Soliciting Freight Agent, Montreal, has been appointed Commercial Agent, Moncton, N. B., vice W. J. P. McGregor, transferred to G. T. Pacific Ry. service.

F. W. BERGMAN, General Manager, G.T.R. and G.T. Pacific Ry. hotels, Ottawa, Ont., has resigned, effective May 1. At the time of going to press, no appointment of a successor has been made.

JAMES CAMPBELL, heretofore Yard Foreman, York, Ont., has been appointed Supervisor of Track, Hamilton to Niagara Falls, and Port Dalhousie to Port Colborne, vice G. Stilson, deceased. Headquarters, Hamilton, Ont.

C. STEWART has been appointed Telephone Inspector at Stratford, Ont., vice G. G. Murray transferred.

G. G. MURRAY, heretofore Telephone Inspector, Stratford, Ont., has been appointed Telephone Inspector, St. Thomas, Ont.

F. G. ADAMS, heretofore Division Freight Agent, G. T. Pacific Ry., Edmonton, Alta., has been appointed Commercial Agent, G. T. R., Winnipeg, vice W. J. Hunter, deceased.

The following station agents have been appointed,—Millbrook, Jct., Ont., G. H. Raymes; Canfield, Ont., W. G. McCulla; outside agency, Toronto, W. J. Moffatt.

Great Northern Ry. A. R. BROOKS has been appointed District Freight and Passenger Agent, Montreal, vice W. T. Hetherington, transferred to Winnipeg.

W. T. HETHERINGTON, heretofore District Freight and Passenger Agent, Montreal, has been appointed District Freight and Passenger Agent, Winnipeg, vice A. Brostedt, resigned to enter Canadian Northern Ry. service.

Intercolonial Ry. JAMES W. BARNETT has been appointed Tariff Inspector and Assistant Weighing Inspector. Headquarters, Moncton, N. B.

Northern Pacific Ry. STANLEY EDWARDS has been appointed Soliciting Agent, Montreal, vice J. W. Maver resigned.

Pacific Great Eastern Ry. With reference to press reports stating that R. J. McDONALD has been appointed External Architect we are officially advised that there is no knowledge of such an appointment at the offices at Victoria, B. C.

Pere Marquette Rd. Effective Apr. 1, the system has been divided into four operating divisions, comprising the Chicago-Petoskey Division, Superintendent, J. W. MULHERN, Grand Rapids, Mich.; General Agent and Superintendent of Terminals, C. HARSCH, Chicago, Ill.; Toledo-Ludington Division, Superintendent, E. E. CAIN, Saginaw, Mich.; Port Huron-Grand Rapids Division, Superintendent, J. L. HAYES, Saginaw, Mich.; Detroit-Canadian Division, comprising Grand Rapids to Detroit, Oak to West Detroit, Walkerville to St. Thomas, Sarnia to Rondeau, London to Port Stanley, Black Rock and Suspension Bridge terminals and ferry operation between Detroit and Windsor, Superintendent, J. J. CORCORAN, Detroit, Mich.; Assistant Superintendent, Canadian Lines, R. S. BLACK, heretofore Trainmaster. Office, St. Thomas, Ont.

W. K. TASKER, heretofore Superintendent, Canadian Division, St. Thomas, Ont., has been appointed Superintendent of Telegraph, vice W. M. Hayes transferred. Office, Detroit, Mich.

Prince Edward Island Ry.—See Canadian Government Railways.

Quebec, Montreal and Southern Ry., Napierville Jct. Ry.—A. L. CURRIE, heretofore Secretary to the company, has been appointed Superintendent, vice J. E. Roberts, appointed General Superintendent, Greenwich and Johnsonville Ry., Greenwich, N. Y. Office, Sorel, Que.

T. BRENNAN has been appointed General Roadmaster, Sorel, Que.

Timiskaming and Northern Ontario Ry. GEORGE W. LEE, heretofore General Agent, North Bay, Ont., has been appointed a Commissioner, vice F. Dane, resigned, on his appointment as Trade Commissioner, Dominion Government, Glasgow, Scotland.

Toronto, Hamilton and Buffalo Ry. H. T. MALCOLMSON, heretofore Superintendent Car Service, has been appointed Superintendent, vice R. A. Barrett, resigned. Office, Hamilton, Ont.

A. E. LOCK, heretofore Commercial Agent, has been appointed Car Accountant, vice H. T. Malcolmson, Superintendent Car Service, promoted. Office, Hamilton, Ont.

White Star-Dominion Line, Canada Line, Austro-American Line. R. F. MACFARLANE, who was formerly identified with the Dominion Line, and latterly with the White

Star-Dominion Line, Montreal, retired Apr. 6, on completion of 40 years active service. The passenger business of the foregoing

lines, which has hitherto been jointly managed by P. V. G. MITCHELL and R. F. MAC-FARLANE, is now in charge of the former.

the transfer is completed, the buildings which they at present occupy will be torn down and the area utilized for other purposes. (April, pg. 171.)

Canadian Pacific Railway Construction, Betterments, Etc.

Montreal Terminals.—A press report states that among the plans under consideration is one for the electrification of the Windsor St. terminals, Montreal.

Campbellford, Lake Ontario and Western Ry.—The work of finishing up this line from Glen Tay to Agincourt, Ont., 182 miles, has been resumed, and it is expected that everything will be completed so as to permit of its opening for operation by July 1.

Humber River Bridge.—The bridge across the Humber River, near Toronto, is a single track one and is the only piece of single track on the line from Toronto west to Guelph Jct., 39 miles. The bridge is 471 ft. long, and consists of three Pratt truss spans of 157 ft. each, at a height of 100 ft. above average low water. The abutments and the two piers of the present bridge are of masonry. The reconstruction of the bridge was decided upon some time ago, but the work is just now being placed in hand. It is proposed to reconstruct the bridge as one, of six spans of 78½ ft. of the deck plate girder type. To do this it is necessary to widen and raise the abutments and piers of the present bridge, and to build three new piers. All the new work on the substructure is to be of concrete. The new piers will be numbered 1, 3 and 5. Numbers 1 and 4 will be built on foundations 24½ ft. by 13 ft., at the base, tapering to 29½ by 7½ ft., and 66 ft. in height. Pier number three, which will be in the middle of the river, will be built on a foundation 50½ by 14½ ft. over all, to 16 ft. above low water, and then tapering to 28 by 7½ ft., with a height of 84 ft. The other two piers, 2 and 4, will have foundations 50½ by 14 ft. over all, including foundation of present piers, and will be tied into the present piers, the whole tapering to 29 by 7½ ft., with a height of 72 ft. The abutments are to be built into the existing abutments. So far as the new work is concerned, it is to be completed underneath the height of the present truss spans, but otherwise to the full height. The contract calls for the completion of this part of the work by Sept. 1. The new steel superstructure for the westbound tracks will be put in position and the track laid, then the traffic will be switched over, the present superstructure removed, and the abutments and piers raised so as to permit the putting in place of the new deck plate girder spans for the eastbound tracks. It is expected that the work will be completed by Dec. 31. The estimated quantities are:—Excavation and trackfilling, 1,300 cubic yards; wet excavation, 250 cubic yards; loose rock and stone, 200 cubic yards; concrete piling where necessary, 900 ft; concrete, 5,000 cubic yards. The contract for the substructure has been let to the Kennedy Construction Co., Montreal, and preparations are being made for starting work. The company is putting in a siding on the west bank of the river, on the north side of the line, to facilitate the work, which will be under the charge of J. A. Irvine, Resident Engineer, Toronto Terminals.

Lake Superior Division.—D. McNicoll, Vice President, is reported to have said at Toronto, April 12, that the work of building a second track along the north shore of Lake Superior would be further proceeded with, and that eventually the entire line from North Bay to Port Arthur will be a double track one.

Manitoba Division.—The Winnipeg City

Council, April 7, approved plans for the building of a subway under the C. P. R. tracks at Salter St. It is not intended to build the subway this year, but to expend about \$60,000 on the approaches. The subway will be gone on with in 1915, unless the advocates of an overhead bridge are able to secure a change in the decision.

The Bergen cut off, which extends from west of Winnipeg into the Transcona yards, is expected to be put in operation, May 1. This will relieve the congestion in the Winnipeg yards, as traffic going through between points east and west will be sent by the cut off.

Saskatchewan Division.—George Bury, Vice President, is reported to have said in the course of a recent interview, it is the intention to proceed this season with the construction of the projected line from Expanse to Assiniboine, where it will connect with the Weyburn-Lethbridge line, and that it is also intended at some time to extend the line from near Expanse to Vanguard, to connect there with the line from Swift Current. The engineers are at present working westerly from Vanguard on this extension.

Alberta Division.—It is expected that the Weyburn-Lethbridge Branch will be completed this year. Construction is proceeding westerly of Shaunavon, Alta., a long stretch of grade is ready for tracklaying, and the material for this is being rushed in.

Additional gangs of men have been put to work on the cut off between Swift Current and Bassano, which it is expected to complete this year. Grading is reported to have been completed, and ties have been distributed as far as Gleichen. The steel for tracklaying has been distributed.

The Suffield branch is expected to be extended to about five miles south of the South Alberta Irrigation Co.'s north dam, by the fall.

Rogers Pass Tunnel.—We are officially advised that McIlwee and Sons, of Denver, Col., have been given a contract, by the general contractors, Foley Bros., Welch and Stewart, for driving the "pioneer" tunnel at Rogers Pass, the plant being furnished by the general contractors.

British Columbia Division.—In a recent interview, F. W. Peters, General Superintendent, is reported to have said that among the improvements to be made during this year is the boring of a 500 ft. tunnel, 40 miles west of Nelson, B.C., through a rock point, and will cut off a very sharp curve as well as eliminate a modern bridge. The plans are said to be ready, and it is expected that tenders will be called for on an early date.

The question of the electrification of the line between Vancouver and New Westminster is reported to be under consideration.

Work has been started on the train sheds and platform shelters for the new passenger terminals at Vancouver. The grade is being raised for the new station level and other work is being pushed forward. Practically all the exterior work on the new station has been completed, and several gangs are engaged on the interior work.

Arrangements were being made at the time of writing (April 13) to remove the Dominion Express Co. and the baggage department into their new quarters. When

Aid Granted to Canadian Northern Railway.

J. H. Burnham, M.P., asked in the House of Commons April 1:—"What aid has been promised, given or otherwise arranged for, directly or indirectly, by the Government to or with the Canadian Northern Ry. Co., or any of its subsidiary lines, or propositions or any part thereof, since the inception of the same?"

In reply the acting Minister of Railways submitted the following statement:—

Canadian Northern Railway.		Paid to
CASH SUBSIDIES	Granted, Dec.	Dec. 31, 1913.
Swan River section	\$ 374,606	\$ 374,606
O. & R.R. Ry.	1,534,526	1,534,526
E.Y. & P. Ry.	91,200	91,200
	\$ 2,000,332	\$ 2,000,332
Canadian Northern Alberta Ry.	\$ 3,120,000	\$ 2,832,024
Canadian Northern Ontario Railway.		
Toronto-Sudbury	\$ 1,872,960	\$ 1,872,960
Toronto-Ottawa	1,600,000	1,363,122
Hawkesbury-Ottawa ...	369,872	369,872
Ottawa-Port Arthur ...	10,920,000	6,518,516
	\$14,762,832	\$10,124,470
Canadian Northern Quebec Railway.		
Garneau-Quebec	\$ 523,820	\$ 523,820
St. Jerome branch	97,280	97,280
Rawdon branch	86,468	86,468
	\$ 707,568	\$ 707,568
Canadian Northern Pacific Ry.	\$ 6,300,000	\$ 4,349,930
Halifax and South Western Ry.	\$ 1,364,210	\$ 1,364,210
Total	\$28,254,942	\$21,378,534
GUARANTEES.		Paid to
Canadian Northern Ry.	\$17,256,584	\$15,397,488 36
Canadian Northern Alberta Ry.	6,719,998	4,391,077 30
Canadian Northern Ontario Ry.	35,770,000	20,149,256 53
	\$59,746,582	\$39,937,822 19

No land was granted direct to Canadian Northern Ry., but this company has received from the contractors for the Lake Manitoba Ry. and Canal Co., the Winnipeg and Hudson Bay Ry. and the Manitoba and South Eastern Ry., 4,002,848 acres.

EDITOR'S NOTE.—The heading of the column of figures under "Guarantees," which reads "Paid to Dec. 31, 1913," is rather misleading, as the Government has not been called on to pay anything in connection with guarantees of C.N.R. bonds. As the guaranteed bonds are sold the proceeds are deposited with the Government and are paid over to the company as the Railway's Department's engineers certify to the amount of work performed.

Safety First on G.T.R.—G. Bradshaw, Safety Engineer, states that the G.T.R. safety committee is doing most effective work in the prevention of personal injuries. From Sept., 1913, to Feb., 1914, inclusive, there was a decrease of 46% in the number of employes killed and a decrease of 16% in the number injured, including all classes of injury, serious or trivial, as compared with the corresponding months of 1912 and 1913. The safety movement was put into effect on the G.T.R. in Aug., 1913.

The C. P. R.'s Algonquin Hotel, St. Andrews, N. B., was practically destroyed by fire April 11, the damage being estimated at about \$500,000. The hotel had been renovated recently, and was ready for opening for the summer season on June 1.

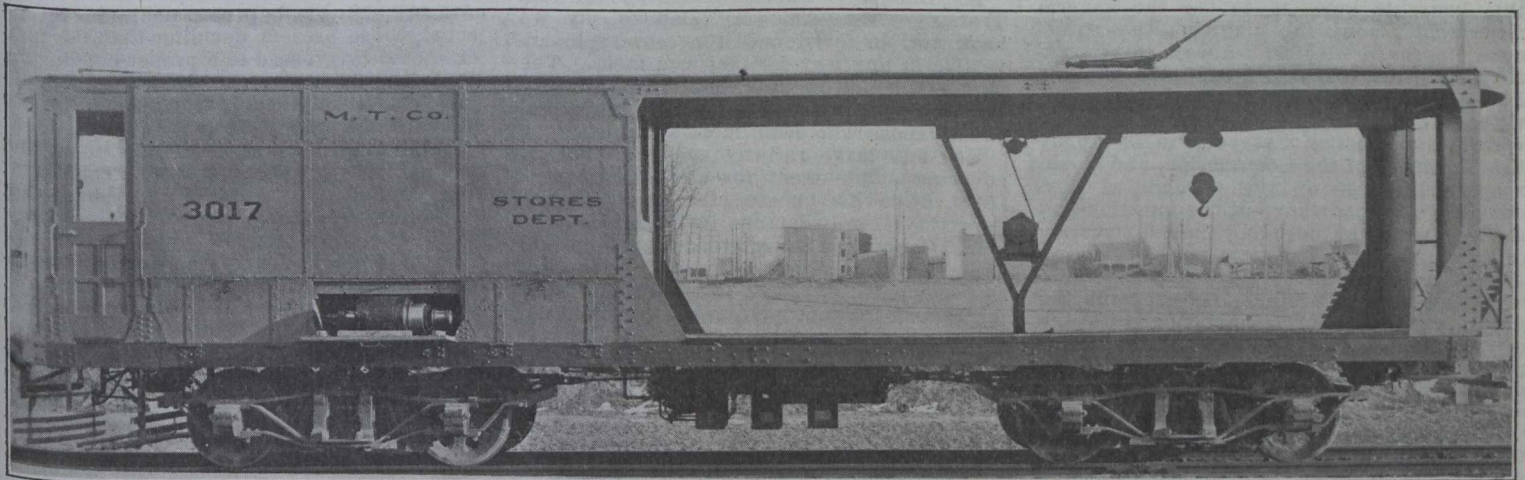
Electric Railway Department

Steel Stores Car for Montreal Tramways Company.

Last autumn, the Montreal Tramways Co. built an all steel stores car, of the design shown in the accompanying illustrations, in its shops at Youville. The design was worked out with the paramount idea of convenience and utility. So well has this been

and is composed of $\frac{7}{8}$ in. planking. The forward end of the car is housed in with steel plating, and the section back of the motor-man's compartment has a double floor, the upper floor being about 20 ins. above the deck, forming an upper compartment, en-

located jib crane, pivoted top and bottom, serving the whole interior. The verticals consist of 2 in. angles, and the jib member, of an 8 in. I beam, on which there is a traveller, air operated, and with a capacity for 3,000 lbs., the operating motor being sup-



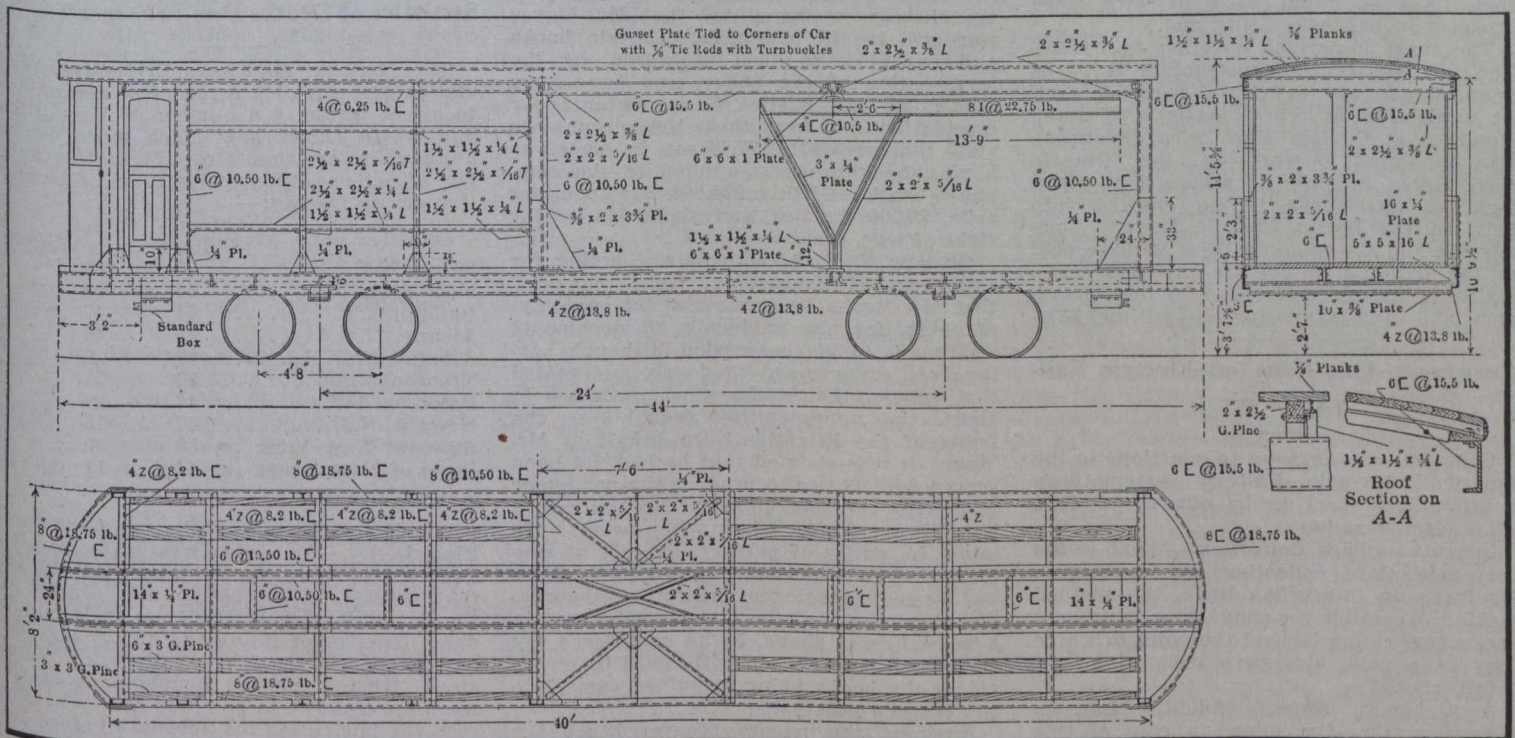
Steel Stores Car, Montreal Tramways Company.

done, that the one car is able to handle the stores for the whole system, carrying them from the main stores at Youville to the several car sheds throughout Montreal, replacing the three stores cars that were formerly used for this purpose. The car makes a complete circuit of the system once a day. The five car sheds are supplied, the daily

tered from both the front and rear ends through doors, in which the smaller stores are carried. The lower floor is divided into three lateral compartments, opening to the sides through downwardly swinging doors, and is used for transporting armatures, which are run in from the side as shown in the photograph, making a convenient ar-

ported in the V of the uprights on a small platform.

The whole car is built of commercial structural shapes and is most solid throughout. The end construction comprises an 8 in. bumper channel, with 6 in. channel corner posts, braced by corner gussets. The trucks are located at 24 ft. centres, and carry



Details of Steel Stores Car, Montreal Tramways Company.

run being 35 miles. The car cost complete about \$1,800.

The over all length of the car is 44 ft., with side sills of 8 in. channels, and intermediate sills of 6 in. channels. The roof is supported on side members of 6 in. channels,

arrangement for handling these members, and keeping them out of danger of damage in transit.

The rear part of the car is open on the sides, and is used for the heavier stores, for the handling of which there is a centrally

four GE-80 motors, controlled by a K-28 controller. The total car weight is 47,600 lbs. The car was built to the designs of D. E. Blair, Superintendent of Rolling Stock, to whom we are indebted for the data on which the foregoing was compiled.

Hydro Electric Power Commission of Ontario and Projected Electric Railways.

The Ontario Legislature has adopted the following resolution dealing with the many proposals now being made for the building of electric railways in rural districts in connection with the Ontario Hydro Electric Power Commission:—"That in the opinion of this house cheap and convenient electric railway transportation facilities is one of the most urgent needs in many rural sections and the towns of the province, and this house is gratified to see the general movement among the municipalities to secure improved electric railway transportation facilities through the Hydro Electric Power Commission. That this house views with satisfaction the prompt manner in which this question has been taken up by the Chairman of the Commission, and would respectfully urge upon the Dominion Government the importance of the question and the wisdom of encouraging the construction of municipal hydro electric radial railways, and that this house further respectfully urges upon the Dominion Government the great importance of co-operating with the province in the development of the water powers created by existing and projected canals and canals now under construction and capable of such development, by the utilization of the waters necessarily supplied thereto and not required for navigation purposes." In addition to the projected line to Port Perry, Whitby, etc., which was the first one suggested to be built under the Commission, meetings in municipalities have been and are being held to advocate the building of lines centering on Guelph, Stratford, St. Marys, London and St. Thomas, which, if built, would serve practically every part of Western Ontario. Engineers are going over many of the routes suggested, with a view of forming conclusions as to such lines as might be built with some prospect of expenses being met.

The most important question to be settled is that of how construction is to be financed and any deficit in operation met. At a meeting of representatives of municipalities at Guelph, Mar. 29, a deputation was appointed to wait on the Ontario Government in order to secure a standard form of agreement to be entered into between the Hydro Electric Power Commission and the municipalities with respect to the building of electric railways. The matter is under consideration by the Government and the Commission. (April, pg. 182.)

Answers to Questions on Electric Railway Topics.

Following are answers to questions in the American Electric Railway Association's question box, sent in by officials of Canadian electric railways:—

Interurban Fare Collection.—What is the best method of collecting and accounting for fares on interurban lines, the method making it possible for conductors to prevent passengers riding beyond the point to which they have paid, also permitting of an accurate check?

A. Gaboury, Superintendent, Montreal Tramways Co.—On suburban cars of this company, no zone collection is made. The conductor collects fares from passenger for full distance he intends to travel, cash or tickets, at the same time issuing a receipt for amount collected. These receipts are of different colors, each color representing a different denomination of fare. The conductor checks his load by means of these

receipts. Special ticket checkers, in uniform, also check up the load unexpectedly, thereby keeping conductors up to the mark. Receipts are all numbered in serial numbers, in pads of 50, and conductors have a waybill to make out, entering on it the first and last numbers of each denomination of receipt, and the total number of each denomination issued, and the total amount as shown on trip sheet must correspond with amount in conductor's farebox.

Employment of Platform Men.—What are the advantages, or disadvantages of advertising in cars or elsewhere for men wanted on train service?

A. Gaboury, Superintendent, Montreal Tramways Co.—Am very glad to say we have not, so far, found it necessary to advertise in any way for platform men. The number of men seeking employment on the cars, is such as to allow us to pick and choose those who seem most suitable.

Has any large railway system a bureau covering employment for all departments? If so, does this bureau hire men for each department, or what are its functions?

A. Gaboury, Superintendent, Montreal Tramways Co.—The employment bureau of this company engages only men for platform work for the operating department.

The Ontario West Shore Railway Muddle.

The enquiry, by the Ontario Railway and Municipal Board, into the affairs of the Ontario West Shore Ry., was resumed at Toronto, Apr. 6. At previous sittings, considerable time was wasted owing to the nonproduction of books and papers of the company, which it was alleged had disappeared, and also owing to the absence of J. W. Moyes, the promoter, on whose behalf medical evidence was tendered that he was mentally and physically unfit to present himself for examination. On the resumption of the sittings, it was stated that Mr. Moyes was still too ill to appear. Certain books and papers have been recovered, by the intervention of the police, and have been placed in the hands of accountants for elucidation, and from these the accountants state that only \$214,177.46 can be placed as having been properly applied to the company's work. Of this, \$74,000 was spent for rails, \$8,500 for ties, and about \$14,000 for right of way, etc.

On Apr. 7, P. A. Malcolmson, acting for the town of Kincardine, Ont., requested that Mr. Moyes be committed for contempt of court, for not producing all documents and bonds in his possession, although having been subpoenaed to do so, and stated that unless the bonds were produced in court, the municipalities would lose the fruits of the litigation. On behalf of Mr. Moyes, it was claimed that he had not been served with notice to produce the particular papers in question and that he had sworn he did not know where they were. He might be guilty of perjury, but not of contempt. The Chairman agreed that there had been disobedience under the subpoena, and suggested that the facts be submitted in a more formal shape, as he considered the Board had been played with, until by an accident the books being examined came into the Board's possession.

Amongst the papers recovered are the progress certificates, on which payments were made out of the trust funds raised by the sale of bonds guaranteed by the municipalities, and attached to each of the 57 certificates, was a calculation slip showing the method by which the amount stated on the certificate was arrived at. These showed an ingenious method of increasing the

amount to be certified. Under the agreements for construction, it appears that two-thirds of the amount of the progress certificates was to be paid out of the trust funds, and the balance by the contractors, and the progress certificates were to represent not more than 90% of the work actually done. The calculations showed that the actual amount expended was treated as the two-thirds portion, sufficient being added to cover the contractors' share, and this inflated amount was certified as 90% of the work actually done.

At a meeting of representatives of the municipalities concerned, at Kintail, Apr. 20, an offer of settlement was made on behalf of J. W. Moyes, but was unanimously rejected, those present deciding that the matter should be pressed to a proper conclusion. The offer was to return to the municipalities \$178,000 of unguaranteed bonds, \$2,000 in cash, and the railway as it stands at present, comprising right of way, steel and ties laid, all work done, and such equipment as is on the road. It was understood that if the offer had been accepted, the enquiry would have been stopped.

On the resumption of the enquiry at Toronto, Apr. 21, evidence was given by V. M. Roberts, the engineer who signed progress certificates, etc., who stated that he realized that he had done wrong in signing the certificates, but, at the time, he thought he was justified. D. M. McIntyre, Chairman of the Board, stated that the remedy for the nonproduction of the bonds, was with the courts, and continued to the effect that if the board is satisfied that Mr. Moyes' health is all right and he does not appear at the next sitting on May 1, he will be committed. When he appeared before, he took refuge behind the matter of missing papers. It may not be fair to make a report without hearing his explanation, but if he is not in attendance at the next sitting, the enquiry will close.

Statistics of Deaths Due to Street Traffic.

The National Highways Protective Association has compiled a record of deaths due to street traffic in a number of U.S. cities, and which shows how much more deadly automobiles are than street cars. The number of persons killed per million of population are as follows:—

	Automobiles.	Street Cars.	Wagons.
Utica, N.Y.	70	29	0
New York, N.Y.	64	23	36
Buffalo, N.Y.	54	47	21
Albany, N.Y.	40	40	10
Atlantic City, N.J.	87	0	0
Trenton, N.J.	52	21	31
Paterson, N.J.	48	8	16
Newark, N.J.	47	18	21
State of New York ..	50	20	22
State of New Jersey ..	44	11	10

Woodstock, Thames Valley and Ingersoll Electric Ry.—An order was made by Mr. Justice Middleton, in Toronto, April 22, for the transfer of possession and control of the W., T. V. & I. E. Ry. from E. B. Stockdale, Receiver of the Grand Valley Ry., the parent concern, to J. G. Wallace, of Woodstock, trustee for the bondholders of the road, the transfer to be made April 23. The receiver must pass his accounts before the local master at Woodstock, and that official is directed to allow all accounts paid at the request of the first mortgagee. Mr. Stockdale was ordered to pay the costs of the action, but may reimburse himself out of any funds that may come into his hands belonging to the second mortgagee or mortgagor.

Electric Railway Projects, Construction, Betterments, Etc.

British Columbia Electric Ry.—Work was reported to have been started, April 1, on the building of a second track on the line from Dominion Road to Head St., and from Lampson St. to Admirals Road, Victoria, B.C. It was expected to have the work completed by April 30. Material is being assembled, it is reported, for the extension of the line from Burnside Road to Harriet Road, and a start is expected to be made on the work early in May. Information that these works would be undertaken was given by A. T. Goward, Local Manager, at the recent meeting of the City Council.

An arrangement has been completed between the Victoria City Council, the Provincial Government and the B. C. E. Ry., for the building of what is known as the proposed Johnson St. bridge. The estimated cost of the work has not been ascertained, but the Government has promised to contribute \$150,000 and the B. C. E. Ry., \$50,000. The work will be carried out by the City Council, under plans to be prepared by the Provincial engineering staff.

The B.C. Minister of Railways has authorized the opening for freight traffic only of the recently completed line from Port Moody through Coquitlam municipality, to mileage 7. (Feb., pg. 87.)

Cape Breton Electric Co.—We are officially advised that no decision has been reached with reference to the extension of the line to New Waterford, N.S., the construction of which has been under consideration for the past two years. (April, pg. 184.)

Dominion Power and Transmission Co.—We are officially advised that the contract with the Canadian Westinghouse Co., for equipment for the new steam power plant at Hamilton, covers the following:—Two 10,000 k.w., 6,600 volt, three phase, 66 2-3 cycle steam turbine generators operating at 200 lbs. steam pressure, 200 degrees superheat, with surface condensers, condensation pumps and boiler feed pumps. All pumps will be centrifugal type, turbine driven. The exciters will be one turbine driven and two motor driven. The step-up transformers will rise from 6,600 volts to 40,000 volts. There will be the usual switchboards, lightning arresters and other accessories. (April, pg. 184.)

Dunnville, Wellandport and Beamsville Electric Ry.—The Ontario Legislature has granted an extension of time for the building of the several lines authorized. (Feb., pg. 87.)

Edmonton Interurban Ry.—A press report states that the company is considering plans for the building of a branch line to Fort Saskatchewan, Alta. (Mar., pg. 135.) Felix Santallier, Edmonton, is General Manager.

Forest Hill Electric Ry.—The Ontario Legislature has extended the time for construction of this projected line north of Toronto, and increased its bonding powers from \$30,000 to \$50,000 a mile. Pending financial arrangements for construction, we are informed that nothing has been arranged as to when the building of the line will be started or when the organization of the company will be completed. (Mar., pg. 135.)

Fort William Electric Ry.—G. H. Adair, Fort William, Ont., is authority for the statement that property owners on Arthur St., between Franklin St. and the western city limits, are working on a scheme for an extension of the street railway between the last two mentioned points. It is proposed to build the line by private subscription and turn it over to the city free of encumbrance,

for operation. It is stated that the extension will be completed and ready for operation by Nov. 15.

Grand Falls to Limestone, N.B.—The New Brunswick Legislature has incorporated a company with this title, to build an electric railway from Grand Falls, on the St. John River, to Limestone, on the boundary between New Brunswick and Maine. Power was asked to build wharves and docks on the St. John River, but the Legislature refused this.

Grand Valley Ry.—The Ontario Legislature has passed an act to enable the Brantford City Council to acquire the franchise of the G. V. Ry. in Brantford and in the counties of Brant and Waterloo; to pass bylaws for the issue of debentures for securing money necessary for the purchase, improvement and operation of the line; to dispose of any portion of the lines to be acquired as may be advisable; and to appoint a commission of not less than three nor more than five to manage the line.

It is not expected that the line will become vested in the City Council until July 1. Until the city gets possession, the council proposes to give every consideration to the best means of improving the lines and in preparing for their effective operation. (Feb., 1913, pg. 90.)

Guelph Radial Ry.—An extension of time has been granted by the Ontario Legislature for the building of extensions authorized in 1908. Power is also given, subject to the approval of the Ontario Railway and Municipal Board, to build half-mile branches of existing lines.

Press reports state that bids are being asked for alterations at the power house. A. H. Foster, Guelph, Ont., is Manager. (April, pg. 134.)

Hamilton St. Ry.—The street railway committee of the Hamilton City Council has been asking the company to lay new rails on a considerable portion of the lines in the city, to build a second track on a section of Sanford Ave., and to build a stub line from the Wentworth St. incline to the International Harvester Co.'s plant. At a meeting of the committee, Mar. 31, General Manager Coleman intimated that owing to present financial conditions and the amount of work still uncompleted on the Kenilworth Ave. extension, there was little likelihood of the company undertaking any other improvements or extension this year. (Jan., pg. 38.)

Hull Electric Ry.—We are officially advised that at present the company is not arranging for any extensions. A press report stated that the company was going to build some second track, and a branch to Notre Dame Cemetery, Hull, Que. (April, pg. 184.)

Kingston, Portsmouth and Catarqui Electric Ry.—H. W. Richardson, President, asked the Kingston, Ont., City Council, April 6, when it would be ready to go on with the paving of Princess and King Streets, as the company is ready to lay down a second track from the Y.M.C.A. building to beyond Alfred St. (April, pg. 184.)

Lacombe and Blindman Valley Ry.—We are officially advised that six miles of grading from Lacombe to near Gull Lake, Alta., was completed last autumn, and that a contract has been let for the construction of the entire line to Rimby, about 20 miles from Gull Lake. Press reports state that the contract has been let to S. S. Hogan. It is expected that part of the line will be put in operation by July 31, and

the remainder completed by Dec. 31. An order has been placed for one passenger car, which will generate its own power, and for one locomotive to handle the freight traffic.

The officers and directors are:—President, J. C. Gibson; Vice President, A. B. Taylor; Treasurer, E. K. Strathy, Winnipeg; other directors:—S. J. Hungerford, Winnipeg; Hon. S. Barker, M.P.; A. J. Taylor, Hamilton; G. S. May, F. C. T. O'Hara, Ottawa; F. Vickerson, J. Dawson, A. Hume, Lacombe, Alta.; J. R. L. Starr, Engineers, Lacombe, and Inkster, Edmonton, Alta. Except where otherwise stated the officers and directors reside in Toronto. (Mar., pg. 135.)

Lethbridge Municipal Ry.—The revised capital expenditures approved by the Lethbridge, Alta., City Council, provide for \$21,610, of which \$3,210 is for improvements at the car barn, and for the provision of a Y and siding at the pavilion in Henderson Park. (April, pg. 184.)

We are officially advised that the proposed extension to Hardieville will be 1.5 miles long and is estimated to cost \$17,000. The track will be laid with 60 lb. rails, A.S.C.E. section. Standard overhead construction for 600 volts, d.c., will be used. The construction of the extension is not likely to be undertaken this year unless the money market gets a little easier. A. Reid, Lethbridge, Alta., is Commissioner of Public Utilities.

Montreal and Southern Counties Ry.—We are officially advised that tenders are under consideration for grading and track-laying on the extension from St. Cesaire to Granby, Que., 15 miles. W. B. Powell, Montreal, is General Manager.

The Board of Railway Commissioners has authorized the opening for traffic of the extension of the lines from Marieville to St. Cesaire, Que., 9 miles, with authority to use the stations, yards and other facilities of the Central Vermont Ry. between these points.

Moncton Tramways, Electricity and Gas Co.—A recent press report states that the company is preparing to make several changes in the location of its lines, among them being the abandonment of the use of the section of the Moncton and Buctouche Ry., in place of which an independent line will be built, and the abandonment of a portion of the High St. line. We are officially advised that the plans are not yet perfected. It is probable, however, that some extensions will be made. An order has been placed with the Canadian General Electric Co. for some new power plant equipment, and orders are being placed for the addition of about 600 h.p. to the boiler equipment. These are to be installed in addition to the plant already in operation, and to take the place of others which are to be discarded. It is also intended to add about 50 lights, either illuminous arcs, or the new nitrogen lamps, to the street lighting system on Main St. (Mar., pg. 135.)

Moose Jaw Electric Ry.—The Moose Jaw, Sask., City Council has been informed by A. H. Dion, General Superintendent, that he has been authorized by the directors to proceed with the extension on Hall St. for half a mile from Main St. The Council passed a resolution calling upon the company to extend the line on Hall St. to 18th Ave., and along that avenue so as to connect with the line now in operation on Athabasca St. East. (April, pg. 184.)

Morrisburg and Ottawa Electric Ry.—The Ontario Legislature has extended the time within which this projected line from Morrisburg to Ottawa, Ont., may be built, and has increased the bonding powers from \$20,000 to \$30,000 a mile. (Mar., pg. 135.)

Niagara Frontier Electric Ry.—The On-

tario Legislature has granted an extension of time for the building of this projected electric railway. G. H. Pettit, Welland, Ont., is the solicitor. (July, 1911, pg. 683.)

Nova Scotia Tramways and Power Co.—Considerable controversy is taking place in the Nova Scotia Legislature with respect to the application for the incorporation of a company with this title. The applicants ask for authority to issue capital up to \$6,000,000, which may be increased to \$10,000,000, and to have authority to take over the Halifax Electric Tramway Co., with all its franchises, at \$170 for each share of the stock outstanding; to take over all rights of the Nova Scotia Light and Power Co. in certain water powers in King's and Halifax counties recently acquired by Hon. N. Curry and E. N. Rhodes, and to develop and distribute electric power throughout the province, etc. The provisional directors include E. A. Robert, J. W. McConnell, F. H. Wilson, F. J. McIntosh, all of whom are directors of the Halifax Electric Tramway Co. The application is being opposed by the Halifax City Council, and by some power companies. The City Council desires to have all reference to the Halifax Tramway Co. struck out, and the Halifax Board of Trade passed a resolution, April 7, in which the bill is characterized as being much more inimical to the city's interests than the one which was defeated in 1913.

North Midland Ry.—An extension of time for the building of the line from London to St. Marys and Stratford, Ont., and another from London to Clinton, Mitchell and various points between, authorized by the statutes of 1904, has been granted by the Ontario Legislature. The company was originally promoted by interests connected with the old South Western Traction Co. T. M. Little, London, Ont., is solicitor. (Feb., pg. 88.)

Ontario West Shore Ry.—An act has been passed by the Ontario Legislature vesting in T. Strothers, Dungannon, Ont., in trust for the municipalities which guaranteed the company's bonds, the franchises, rights and privileges of the company. The municipalities are already in possession of the line, which was partially constructed. An extension of time is also granted for the building of the line, which was to extend from Goderich to Kincardine, and other points on the shore of Lake Huron. (April, pg. 184.)

Oshawa Ry.—An arrangement has been made under which the company will do the terminal work at Oshawa for the C.P.R., on the same terms and conditions as it has been doing the terminal work of the Canadian Northern Ry. since it opened its line into Oshawa, and as it has been doing the terminal work for the G.T.R. for years. The company is under G.T.R. control.

Ottawa, Rideau Lakes and Kingston Ry.—An extension of time has been granted by the Ontario Legislature for the building of this projected railway between Ottawa and Kingston, Ont. The company is also authorized to build a branch line from near Lombardy, on the projected main line to Perth, and to increase its bonding power from \$30,000 to \$40,000 a mile. (Feb., pg. 88.)

Owen Sound, Ont.—Toronto and Montreal interests are negotiating with the Owen Sound, Ont., Town Council for a franchise for an electric railway. A 25 year franchise is asked for, the applicants proposing to build eight miles of lines in the town, and a 20 mile line to Meaford, on which steam locomotives would also be used. A guarantee of bonds is being asked. Owen Sound papers stated, April 14, that Sir William Van Horne and Sir Thomas Tait were interested in the project.

Peterborough Radial Ry.—We are officially advised that it is proposed to spend about \$40,000 on the line during this year. The bulk of this will be expended upon one mile of track in the central portion of the city, which will be entirely renewed, owing to the City Council laying pavements on the streets on which the line runs. The work will consist of laying 80-335 Lorain sections, and 80 lb. A.S.C.E. section rails, with brick pavement between rails and four bricks wide on the outside. A siding will be laid to the C.P.R. station, on which it is proposed to operate a car which will meet inbound C.P.R. trains and afford passengers direct street car service to all parts of the city. It is also proposed to reduce the headway between cars from 15 minutes to 12 minutes, and later on to 10 minutes, by the addition of extra rolling stock on certain lines. The new track and other improvements will necessitate the purchase of about \$8,000 worth of Y's, turnouts, steam road crossings and switches. All new work will be arranged to take both M.C.B. and street railway flanges, and new curves are being run to provide for the passage of freight cars around them. The company has in view the carrying on of a freight interswitching and transfer business between the steam railways and the industrial sites which they do not reach. (Feb., pg. 88.)

Regina Municipality Ry.—The commissioners operating the railway received tenders to Apr. 27, in four sections, for street railway material, as follows,—(a) 100 tons 7 in. T steel rails, Lorain section 80.335, 1,000 track bolts and nuts $\frac{3}{4}$ by $3\frac{3}{4}$ ins., 1,200 copper rail bonds $10\frac{1}{4}$ ins., 60 ditto 42 ins., 60 ditto 62 ins.; (b) 9,000 barrels Canada portland cement; (c) 3 miles 500,000 c.m., t.b.w.p. 19 stranded feeder wire, 2 miles 4.0 t.b.w.p. 19 stranded feeder wire, 10,000 ft. 2.0 hard drawn round trolley wire; (d) trolley frogs, crossovers, line ears, insulators, hangers and pole line hardware.

St. Catharines, Merritton and Thorold Electric Ry.—At a special meeting of the Thorold, Ont., Town Council, April 12, a bylaw was passed granting the company right of way for an extension from the head of Main St. into the factory district.

St. John Ry.—We are officially advised that the extensions to which reference was made in the report presented at the recent annual meeting are from Kanes Corner to Old Loch Lomond Road, three miles, and from One Mile House to Coldbrook, two miles.

Tenders are under consideration for the erection of car sheds on Wentworth St. H. C. Mott, St. John, is architect. (Feb., pg. 88.)

The Sandwich, Windsor and Amherstburg Electric Ry. owns a lighting plant in Windsor, Ont., for which the City Council has made an offer of \$155,000. This was refused, and the Council, April 3, decided to proceed to expropriate the plant, with the object of eliminating competition with the hydro electric system. The Council, the same day, decided to call upon the company to equip all its cars with air brakes, to provide snow cleaning equipment, and to carry out other improvements.

Some time ago the City Council approved of the building of a spur line on Ferry St., and on April 6 the company started work on it. Some members of the council desired to have the permission withdrawn, and wished to have the police stop work, but the transportation committee met and decided that work could go on subject to the supervision of the City Engineer.

The Sandwich Municipal Council informed the company, April 6, that it was about to proceed with the paving of Bedford St., and that if the company was

ready to proceed with the laying of a second track there, the two works could be carried out together. (April, pg. 184.)

At a meeting of the Windsor City Council, April 14, the Council reaffirmed the resolution passed Feb. 2, granting the company permission to build a line along Ferry, Chatham and Victoria streets to connect with the existing line on London and Sandwich streets and directed that the necessary bylaw be prepared.

Sarnia St. Ry.—Press reports state that application is being made to the Sarnia, Ont., Town Council for permission to extend the lines in the town. G. E. Wadland, Sarnia, is Manager and Purchasing Agent. (April, pg. 134.)

Saskatoon Municipal Ry.—About 300 ft. of snow fencing has been erected along the line between Saskatoon and Sutherland, Sask., where experience has shown that such protection is necessary.

The ratepayers of Saskatoon are being asked to vote on a bylaw to expend \$25,000 upon extensions to the railway. (Mar., pg. 136.)

Sudbury-Copper Cliff Suburban Electric Ry.—The Ontario Legislature has confirmed a bylaw granting a franchise for the building of lines in Sudbury, Ont. The principal terms of the agreement were referred to on pg. 593 of our issue for Dec. 1913. The act also grants the company an extension of time for the building of the various lines authorized to be built in the vicinity of Sudbury and Copper Cliff. (Mar., pg. 136.)

Toronto, Barrie and Orillia Ry.—An extension of time for the building of this line from Toronto to Barrie and Orillia, Ont., has been granted by the Ontario Legislature. The first piece of line which it is proposed to build is from Barrie to a junction with the C.P.R. Toronto-Sudbury line, in connection with which is a franchise for an electric railway in Barrie. The act passed this session gives the company power to build the line from Barrie to Utopia, on the C.P.R. We are advised that it is expected to start construction on this piece of line as soon as the organization arrangements of the company are completed. (Mar., pg. 136.)

Toronto Ry.—The Railway Committee of the Ontario Legislature, by a vote of 10 to 9, approved recently of the clause in the Toronto City Council's bill providing for the operation of the T. R. cars through to Munro Park. This was formerly the terminal, but when the Scarborough Beach park was developed the company made that its terminus. A stub line service was subsequently put on by arrangement with the city. The Legislature Railway Committee directs that the terms of payment and service given for such portion of the line be left to the Ontario Railway and Municipal Board. (Feb., pg. 88.)

Transcona, Man.—We have been advised that while the Town Council of Transcona has power under an act passed last session of the Manitoba Legislature, to build and operate an electric railway in that town, no plans have been prepared and no arrangements have been made for building such a line, or for connecting it when built with the Winnipeg Electric Ry. (April, pg. 185.)

Winnipeg Electric Ry.—It was reported at the meeting of the Stonewall Municipal Council, April 3, that it will be midsummer at the earliest before the extension into Stonewall is completed. (April, pg. 185.)

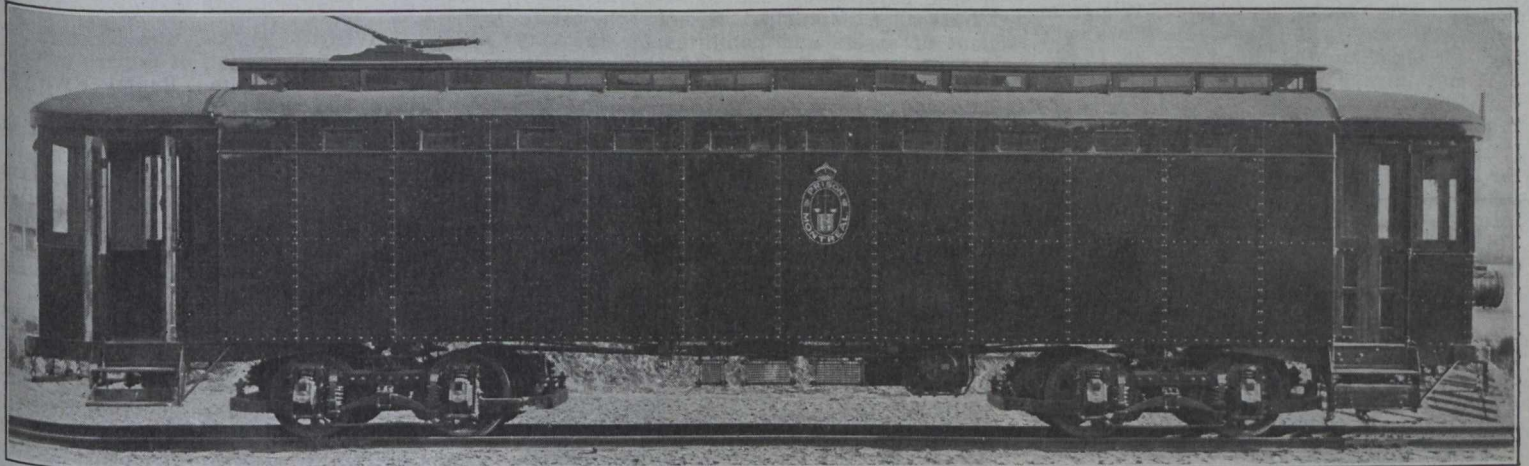
A. Reid, Commissioner of Public Utilities, Lethbridge, Alta., in remitting his renewal subscription to Canadian Railway and Marine World writes:—"It is worth \$2 to me."

Prison Car for Montreal Tramways Company.

On the building of the new Bordeaux prison, about 7 miles north from the Montreal court house, the problem of transferring the prisoners between the court house and prison was presented, as the distance between the two places is considerably greater than usually exists between these related institutions. As the Sault au Recollet line

The sheathing is riveted together, and thus forms a full side sheet, forming a deep side girder, relieving the wooden side sills. Just below the deck, there are 13 by 4½ in. windows, 10 per side, placed above the line of vision for obvious reasons. Ventilation is obtained in the usual manner from the monitor roof, augmented by forced draught from

and transferring there to prison vans for the balance of the trip. A spur will be built from the main line, running directly into the prison yard, and will also be used for transporting fuel and other supplies to the prison. Montreal is said to be the first city in America to employ this means of transporting prisoners, but a car is used for this purpose in Berlin, Germany. It is cheaper than patrol waggon transportation, and has the added advantage of saving the prison-



Prison Car, Montreal Tramways Co., for Operation Between Montreal and Bordeaux Prison.

of the Montreal Tramways Co. passes within a short distance of the new prison, arrangements were made by the provincial authorities for the company to build a special car for this service, which is illustrated herewith.

The car is remodelled from an old interurban car, practically the whole of the frame of the original car being retained, the

a heater in the front of the car.

The interior seating arrangement resembles the usual cross seat car layout, with the difference that the body is divided into two main sections by a midway partition, the object being to separate the convicted prisoner from those about to be tried, as required by law. At the end of each section, there is a guard's seat, raised on a 6 in.

ers from a great deal of needless humiliation. The car has a seating capacity for 54, and makes the trip between the two points twice a day.

Winnipeg River Power Co.—A press report, April 13, stated that work was started the previous day on a railway line of 12 miles from Lac du Bonnett to the site of the



Interior of Prison Car, Looking Forward.



Interior of Prison Car, Looking Towards the Rear.

sheathing and interior arrangement being altered to suit the special service for which it is intended. It is 48 ft. 4 ins. over all, with a length between bulkheads of 34 ft. 8 ins. The underframing consists of 7 in. side sills, extending the length of the body. The side framing has received the principal alteration, the sheathing consisting of no. 16 sheet steel, carried clear up to the roof decking, and attached to 2 by 3 in. vertical posts.

platform, to enable a better view of the interior being obtained. On the rear platform there is a small compartment on the inner side of the car, reserved for the use of the governor of the prison. All the doors are locked and barred. The car is equipped with four Westinghouse 533-T-4 motors, with a K-35-G controller.

The prisoners are now being transported to the point nearest the prison on the cars,

new power plant at the Grand Bonnet Falls of the Winnipeg River. It is reported that J. G. White & Co., the Engineers, have under consideration three alternative plans for building the dam and plant, and that it is expected tenders will be asked for the entire work early in the summer.

The Chatham, Wallaceburg and Lake Erie Ry's power house at Chatham, Ont., was wrecked by an explosion of gas recently.

Electric Railway Finance, Meetings, Etc.

Brantford St. Ry.-Grand Valley Ry.—The appeals in the actions of the city of Brantford against the company have been enlarged to May 4.

British Columbia Electric Ry. and Allied Companies.—Gross earnings for Feb., \$704,002; operating expenses, maintenance, etc., \$513,748; net income, \$190,255, against \$688,333 gross earnings; \$512,816 operating expenses, maintenance, etc.; \$175,517 net income, for Feb., 1913. Aggregate gross earnings for eight months ended Feb. 28, \$6,034,831; net income, \$1,627,616, against \$5,682,428 aggregate gross earnings; \$1,626,838 net income for same period, 1912-13.

Cape Breton Electric Co.—Gross earnings for Feb., \$25,284.98; operating expenses and taxes, \$15,697.72; net earnings, \$9,587.26; interest charges, \$5,211.36; balance, \$4,375.90; bond sinking and improvement funds, \$1,190; balance for reserves, depreciation, etc., \$3,185.90; against \$26,141.44 gross earnings; \$17,005.50 operating expenses, taxes, etc.; \$9,135.94 net earnings; \$4,881.26 interest charges; \$4,254.68 balance; \$1,190 bond sinking and improvement funds; \$3,064.68 balance for reserves, depreciation, etc., for Feb. 1913. Aggregate gross earnings for two months ended Feb. 28, \$55,083.27; net earnings, \$20,822.37; interest charges, bond sinking and improvement funds, \$12,838.73; net balance, \$7,983.64, against \$57,976.87 aggregate gross earnings; \$23,210.88 net earnings; \$11,894.45, interest charges, bond sinking and improvement funds; \$11,316.43 net balance, for same period 1913.

Lethbridge Municipal Ry.—The financial statement for the year ended Dec. 31 shows total receipts of \$60,609.82, and total operating expenditures (including \$4,883.96 for management expenses) of \$64,757.37, leaving a deficit on the year's operations of \$4,157.75. The debenture interest and sinking fund for the year amounted to \$26,683.47, making a total cost to the citizens for the electric railway of \$30,831.22.

The general balance sheet shows total liabilities of \$452,806.21, against which there are the following assets:—cost of line, car barns, rolling stock, etc., \$352,275.59; stock on hand, \$3,962.87; cash and accounts receivable, \$8,957.83; sinking fund, \$7,281.12; unexpended debenture funds, \$17,224.41. The discount on debentures and the loss in operating since the line was opened amount to \$75,384.51.

Mount McKay and Kakabeka Falls Ry.—In addition to its railway the company has certain power rights on the Kakabeka River, and the Fort William, Ont., City Council has expressed the opinion that if it was made certain that these could be acquired and developed the purchase of the company's line and property would be a good thing for the city. Without the power rights the line would be of no special advantage. The Council has the matter still under consideration.

Pictou County Electric Co.—An issue of first mortgage 50 year sinking fund gold bonds, dated May 6, 1913, and due May 6, 1943, being balance of the original issue, is being offered in Montreal, at a price to yield just over 6%. The company was originally incorporated in 1902 as the Egerton Tramway Co., and in 1909 purchased the New Glasgow Electric Co. It now operates about 10 miles of tramway in, and connecting, Trenton, New Glasgow, Stellarton and Westville, N. S. The railway earnings for 1913 were \$77,833, passengers carried, 1,637,351. The officers and directors are, President, C. A. Flaherty, Boston, Mass.; Vice President, M. L. Flaherty, New Glasgow, N. S.; other directors, E. M. McDonald,

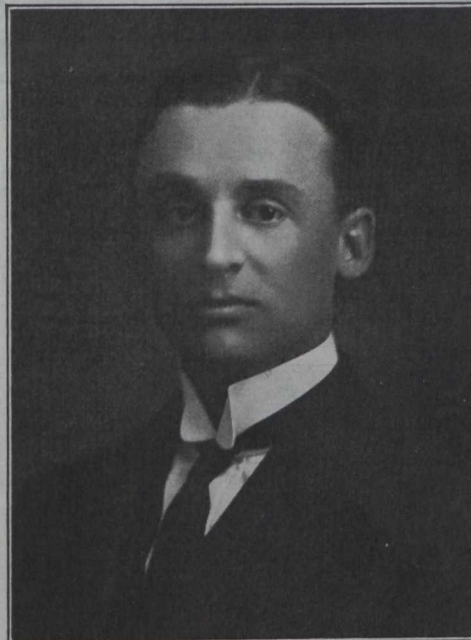
M. P., Pictou, N. S.; A. Perry-Martin, Newtown, Mass.; Gardner Perry and W. B. Rogers, Boston, Mass.

Saskatoon Municipal Ry.—Receipts for Feb., \$9,466.27, against \$14,943.82 for Jan. Passengers carried, 268,811; mileage of cars, 40,530. Total operating expenses, including interest on capital, etc., \$14,028.27. The decrease in receipts is due to the breakdown of the generators, Feb. 18 and 19, and the consequent tying up of the service for several days.

Saskatoon Municipal Ry.—In the statement of assets and liabilities for the City of Saskatoon, Sask., for 1913, the assets include the street railway, valued at \$691,166.73.

St. John Ry.—Following are the officers and directors for the current year:—President, H. H. McLean, M.P., St. John, N.B.; Vice President, F. R. Taylor, St. John; other directors:—R. B. Emerson, J. Manchester, W. H. Thorne, St. John; J. K. L. Ross, Montreal.

St. Thomas Street Ry.—The St. Thomas, Ont., City Council has provided \$8,000 in the estimates to cover the estimated deficit on the operation of the street railway during



R. H. Sperling,
General Manager British Columbia Electric
Railway.

the current financial year. This is \$2,000 less than in 1913.

The Mayor recently informed the City Council that an offer had been made him for the leasing of the line. It was decided to invite a definite offer in writing. Reports state that the offer was made in the interests of the London and Lake Erie Ry. and Transportation Co. Up to the time of writing no offer had been received by the committee in charge of the street railway.

Toronto and Mimico Ry.—The Toronto City Council has not decided on any definite policy with reference to the taking over of the Sunnyside-Humber section of this line, now part of the Toronto and York Radial Ry.'s Lake Shore Division.

Toronto Ry., Toronto and York Radial Ry., and allied companies.—Gross earnings for Feb., \$777,683; operating expenses, maintenance, etc., \$400,357; net earnings, \$377,326, against \$718,313 gross earnings; \$377,483 operating expenses, maintenance, etc.; \$340,830 net earnings for Feb., 1913. Aggregate gross earnings for two months ended Feb. 28, \$1,625,628; net earnings, \$784,934, against \$1,495,241 aggregate gross earnings; \$716,603 net earnings for same period, 1913.

Winnipeg Electric Ry.—Gross earnings for Feb., \$350,977; operating expenses, \$213,104; net earnings, \$137,873, against \$320,431 gross earnings; \$177,897 operating expenses; \$142,534 net earnings for Feb., 1913. Aggregate gross earnings for two months ended Feb. 28, \$733,648; net earnings, \$294,366, against \$671,928 aggregate gross earnings; \$294,500 net earnings for same period, 1913.

Personal Paragraphs.

W. T. WOODROOFFE, who recently resigned from the position of Superintendent of the Edmonton, Alta., Radial Ry., has removed to Vancouver, B.C.

F. CONWAY, Chief Engineer, British Columbia Electric Co., gave an address to the company's employes, who are members of the social club, at Vancouver, April 2, on the development of the company's undertaking during the past ten years.

R. P. LEWIS has been appointed Traffic Inspector by the Winnipeg City Council, in connection with the recent report on the street railway situation and the rerouting of cars, as made to the Manitoba Public Utility Commission, by R. M. Feustel. The new regulations went into effect Apr. 16.

DUNCAN McDONALD, formerly General Manager, Montreal Tramways Co., and a former President of the Canadian Street Railway Association, has been elected as one of the city controllers of Montreal. The term of office is four years and the yearly salary \$7,500.

W. G. MURRIN, heretofore Mechanical Superintendent, British Columbia Electric Ry., has been appointed General Superintendent, and in addition to the Mechanical Department, hitherto under his control, he has charge of the City and Suburban Transportation Departments. Office, Vancouver, B. C.

T. R. CUMMINS, Engineer, Niagara, Welland and Lake Erie Ry., Welland, Ont., has resigned on account of the unlikelihood of there being any construction work on the line this year. He expects to take charge of the surveys of a large timber property in British Columbia, with headquarters at Revelstoke.

A London, Eng., cablegram at the end of March stated that R. H. SPERLING, General Manager, British Columbia Electric Ry., had been offered a seat on the company's board with the position of Assistant to the Chairman, R. M. Horne-Payne, in London. Mr. Sperling has gone to London in this connection and during his absence the Comptroller, GEORGE KIDD, will be acting General Manager.

ROCHFORD HENRY SPERLING, General Manager, British Columbia Electric Ry., Vancouver, B.C., whose portrait appears in this issue, was born in London, England, Feb. 9, 1876, and entered transportation service Feb., 1896. His service with the B.C. Electric Ry. dates from 1898, since when, to 1900, he was Superintendent, Victoria Branch, Victoria; 1900 to 1901, General Superintendent and Assistant Engineer, Victoria; 1901 to 1905, General Superintendent and Chief Engineer, Vancouver. In 1905 he was appointed General Manager, which position he still holds.

The Interurban Co., which recently applied to the Dominion Parliament for authority to change its name to that of the Interurban Telephone Co., is applying for a further change to that of the Rio de Janeiro and Sao Paulo Telephone Co. This is the company which the Toronto City Council thought might have been used for the building of electric railways in Toronto.

Electric Railway Notes.

The Montreal Tramways Co. has received 10 steel underframe city cars, from Canadian Car and Foundry Co.

The Winnipeg Electric Ry. is arranging so that in future all its cars shall stop on the near side of crossings.

The Moncton Tramways, Electricity and Gas Co. will, it is reported, be in the market during the year, for several single truck cars.

The Montreal and Southern Counties Ry. has filed its standard freight tariff to be applied between all stations on its line. It went into effect Apr. 13.

The Sandwich, Windsor and Amherstburg Ry. Co. has declined the offer of the civic light committee of the Windsor, Ont., City Council, of \$155,000 for its lighting plant.

The Manitoba Public Utility Commission is considering the matter of ordering the Winnipeg Electric Ry. to adopt the p-a-y-e system on all future cars put into service.

The car barns of the Toronto and York Radial Ry.'s Mimico Division were badly damaged by fire, Mar. 30. Two cars, valued at \$12,000, were destroyed, and the damage to the building is estimated at \$3,000.

The Edmonton Radial Ry. has received two single ended, double truck city cars, mounted on standard trucks, with Westinghouse 101 B2 quadruple equipment, from Preston Car and Coach Co.

The Regina Municipal Ry. has received tenders for four double truck cars, similar to the 16 supplied during last year by Preston Car and Coach Co., except that they will be 6½ ft. longer, with seating accommodation for six additional passengers.

The Lethbridge, Alta., City Council, in view of the continued loss on the operation of the electric railway in the city, is considering the advisability of reducing the staff, so that one man will act both as motorman and conductor. This system has recently been put in operation on the Brandon Municipal Ry.

The British Columbia Electric Ry. has received ten double ended, double truck city cars, mounted on 27 G1 trucks with Westinghouse 101 B2 quadruple equipment, for its Victoria service; and five single ended, double truck city cars, for its Vancouver service, from Preston Car and Coach Co.

The appeal of the Montreal Tramways Co., from the decision of the Quebec Public Utilities Commission ordering the company to give details of its workings, on the ground that the commission had no jurisdiction, has been dismissed by the Court of the King's Bench, Montreal, the court holding that the commission has ample powers.

Sir Hugh Graham, who owns the Star and controls other newspaper properties in Montreal, recently denied that he owned 10,000 shares of Montreal Tramways Co.'s stock, as was reported. He stated that he did not own one share in the company, nor had he any option, promise, or expectation of any shares, and offered \$1,000,000 if his statement is found to be incorrect.

The officers and operating officials of the Montreal Tramways Co. have started a safety first campaign among its employes, and for the benefit of the general public. Personal letters have been addressed to motormen and conductors, and placards have been posted throughout the city calling public attention to definite points in reference to which the people can aid the company's employes in preventing accidents.

The Peterborough Radial Ry. has ordered from the Ottawa Car Mfg. Co., one single truck, semiconvertible, p-a-y-e car, equipped with 21-E truck, 8ft. wheel base, life

guards, arc headlight, scrapers, rattan covered seats, curtains and polished bronze trimmings. The interior will be finished in quarter cut oak, and the complete motor equipment will be supplied by Canadian General Electric Co.

M. O. Robinson, General Manager of the Port Arthur Electric Ry. and of the Fort William Electric Ry., has issued a notice with respect to the operation of a baggage car. No parcels will be carried on passenger cars, and parcels and freight will only be accepted for rcarriage in the baggage car and on the Port Arthur-Fort William line. No c.o.d. parcels will be accepted. Shippers may use a freight receipt, books of which may be bought for \$1, otherwise they must pay cash to the baggageman on shipping their freight. The rates are 5c., 10c. and 25c. Claims for lost goods must be made within 24 hours. The baggage car will make six trips a day each way.

The Guelph Radial Ry. has received two double ended, p-a-y-e city cars, mounted on standard trucks with rolled steel wheels, Westinghouse 101 B2 quadruple equipment and S. M. 1 air brakes, and with all steel underframes, and semisteel sides and ends, from Preston Car and Coach Co. The interior arrangement is a slight departure from that hitherto adopted by the G. R. R., in that they have no bulkheads. The exit and entrance doors are under the conductor's control, and the front door exit under the motorman's control. By a careful arrangement of the steel members in the body, weight is eliminated to a great extent, and a more commodious car with great carrying capacity is provided, with minimum weight.

Second Track Mileage and Freight Carried on Electric Railways.

Of the 26 operating electric railways in Canada, 20 operate 371.14 miles of second track, and 23 carry freight on their lines. The mileage of second track operated, and the tons of freight carried for the year ended June 30, 1913, are given in the following table:

	Length of Second Main Track, Miles.	Number of Tons of Freight Carried.
Berlin and Waterloo S. R.	1.48	.....
Brantford and Hamilton Ry. ....	.....	8,503
British Columbia E. R.	118.56	448,750
Calgary Municipal Ry.	12.00	.....
Chatham, Wallaceburg and Lake Erie Ry. ....	.....	125,553
Cornwall S. R. ....	.....	81,640
Edmonton Radial Ry. ....	.....	42,780
Galt, Preston and Hespeler E. R.	1.36	202,547
Grand Valley Ry.	1.95	292
Guelph Radial Ry. ....	.....	12,680
Halifax Electric Tramway	8.70	.....
Hamilton, Grimsby and Beamsville E. R. ....	.....	44,854
Hamilton Radial Ry.	8.69	14,923
Hull E. R.	10.60	7,327
Levis County Ry. ....	.....	4,190
London St. Ry.	6.79	.....
Montreal Park and Island Ry.	16.03	111,005
Montreal S. R.	60.10	100,000
Montreal Terminal Ry.	4.28	91,302
Moose Jaw E. R.	1.50	.....
Niagara Falls Park and River Ry.	11.20	.....
Niagara, St. Catharines and Toronto Ry. ....	.....	356,150
Oshawa Ry. ....	.....	169,278
Ottawa E. R.	21.42	.....
Port Arthur and Fort William E. R. ....	.....	18,565
Quebec Ry., L. & P. Co., Citadel Division ....	.....	3,600
Quebec Ry., L. & P. Co., Montmorency Division	9.80	.....
Regina Municipal Ry.	7.33	.....
Sandwich, Windsor & Amherstburg Ry. ....	.....	2,500
Sarnia S. R. ....	.....	8,610
St. John Ry.	6.50	.....
Toronto Ry.	61.72	.....
Toronto and York Radial Ry. ....	.....	67,558
Windsor, Essex & Lake Shore Rapid Ry.	1.13	35,323
Total	371.14	1,957,930

Halifax Electric Tramway Company's Annual Report.

Following are extracts from the report of the calendar year 1913 presented at the annual meeting in Halifax, N.S., recently.

During the year the operations were carried on with satisfactory results. The policy of the company being to develop and improve its various services, a large amount of construction work was performed, including the double tracking of Campbell Road, Inglis and Hollis Streets, and the extension of the track on Quinpool Road from Oxford St. to the Arm Bridge. Six modern closed cars were added to the rolling stock, additions made to car equipment, the electric light system was extended and a new luminous arc system installed on Barrington and Granville Streets. In addition to the capital expenditure above referred to, and apart from repairs chargeable to operating account, a comparatively large amount was expended in renewals and betterments. The foregoing expenditure has resulted in greatly improving the tramway and electric light services and the physical condition of the property has been well maintained.

The company has continued its liberal policy toward its employes in respect to wages. In May last substantial increases were made in the rates and an agreement entered into with the employes for two years.

The directors desire to express their appreciation of the very efficient and valuable services of all the officials in charge of the company's operations.

Profit and Loss Account.

Passenger receipts	\$301,771.11
Electric light and power, gross earnings.	232,554.89
Gas department, gross earnings	62,076.75
Miscellaneous earnings	9,531.07
Total	\$605,933.82
Operating expenses	\$337,008.99
Interest on mortgage bonds	30,000.00
Renewals and betterments	8,117.98
Provision for bad debts	500.00
Dividends	112,000.00
Balance to surplus account	118,306.85
Total	\$605,933.82

Surplus Account.

Balance Dec. 31, 1912	\$704,119.54
From profit and loss account Dec. 31, 1913	118,306.85
Total	\$822,426.39
Extraordinary expenses	\$ 24,490.65
Adjustment of liability insurance premiums (3 years)	3,014.10
Balance Dec. 31, 1913	794,921.64
Total	\$822,426.39

The percentage of operating expenses to income was 56.36%; passengers carried, 6,876,003; car mileage, 1,275,527.

The directors for the current year are:— E. A. Robert, Montreal, President; J. W. McConnell, O. E. Smith, Vice Presidents; W. G. Ross, F. H. Wilton, Sir Frederick Borden, H. H. Smith, W. M. P. Webster, J. A. Neville, J. E. Wood, P. J. McIntosh. The Manager is J. W. Crosby.

Canadian Auto Bus Co.'s Franchise.—The appeal from the decision of Justice Demers in the action of D. Robertson, a shareholder of the Montreal Tramways Co., to have the franchise granted to the Canadian Auto Bus Co. by the Montreal City Council, set aside, has been set down for hearing at the May sittings of the Quebec Supreme Court. The decision appealed against held all the proceedings of the Board of Control and of the City Council in regard to the granting of the franchise as having been legal and regular.

The Toronto and York Radial Ry. is in the market for 3 cars for its Mimico Division to replace those which were burned recently.

Marine Department

The Steamship Manchester Commerce Repaired at St. John's, Nfld.

Complete repairs to the Manchester Liners' s.s. Manchester Commerce, which was damaged in a collision with an iceberg in the Belle Isle Straits in Oct., 1913, were carried out in the Reid Newfoundland Co.'s dockyard at St. John's. Reference to the illustrations on this page will show the extent of the damage, and it was feared that the work was of too extensive a nature for other than temporary repairs to be undertaken locally. The repairs covered the removal of about 60 damaged plates and replacing them with new ones, and the placing in position of a complete

The Proposed Georgian Bay-Montreal Ship Canal.

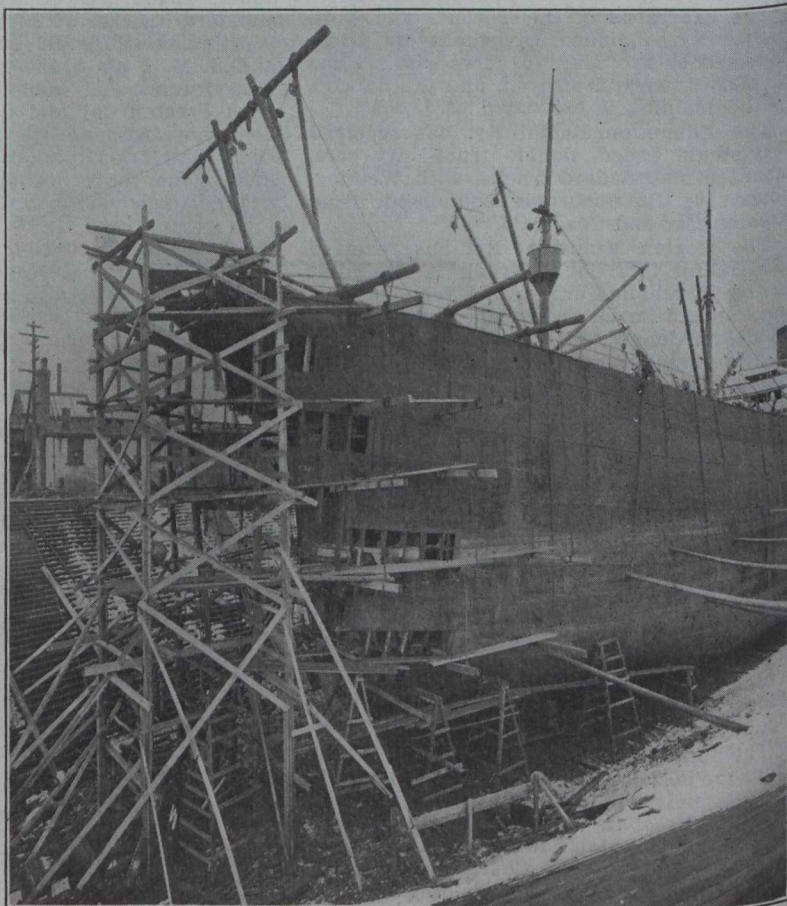
As reported in our last issue, a commission has been appointed to enquire into the commercial possibilities of the proposed canal to connect the Georgian Bay with the St. Lawrence River at Montreal. The commission consists of:—W. Sanford Evans, Winnipeg, chairman; F. S. Meighen and E. Gohier, Montreal, with J. D. Hepburn as Secretary. The authorization of the commission covers the following points:—

A study of the transportation problem in relation to the proposed waterway, and to what extent it can help in developing the resources of the country; the advantages

waterway; traffic of the Great Lakes and how it reaches the seaboard; the percentage of Canadian traffic handled through U.S. ports, and causes for this diversion;

Lake transportation; rates which obtain; lake and rail rates as against all rail rates, also a comparison with an all water route rate, and a comparison between the proposed Georgian Bay ship canal route, and all the competing routes in existence and in course of construction, and their capacity; comparative cost of transportation per ton mile, rail, lake and rail, and all water;

A comparison of the volume of traffic which may be handled by water as against the rail routes within the same period; and possible economic advantages of such a



The s.s. Manchester Commerce in Dry Dock at St John's, Newfoundland.

new stem, in addition to a few minor repairs. The work was carried out under the direct charge of W. E. Ladley, Superintendent of Motive Power, R.N. Co., and was completed in 47 days, or within three days of the time limit, as fixed by the contract. It is stated that this is the largest undertaking of the kind carried out at St. John's, and it is satisfactory to know that such repairs can be handled on this side of the Atlantic, instead of making temporary repairs, until the vessel can be taken to Great Britain, or sending the work to U.S. yards. The amount spent in local labor approximated \$30,000

J. L. WELLER, M. Can. Soc. C. E., Engineer in Charge, Welland Ship Canal, addressed the Canadian Society of Engineers, and the graduates of the School of Practical Science, Toronto, Apr. 16, on the work of building the new ship canal.

of a large waterway from the lakes to the seaboard, open to the largest type of lake carriers, and the feasibility of these carriers navigating such waterway, and the influence on the rate regulation of transport, especially upon cheaper commodities which the country produces; the competition of the waterway with the railways; the effect on railways by creating new industries, on account of cheap transportation of low grade freight that cannot be handled by rail, causing expansion in industries and increase to the population and demand for a higher class of freight seeking transportation by rail;

The probable volume of traffic available on account of the natural advantages of such waterway, which would be the shortest and deepest water route from the head of the lakes to the seaboard for the largest lake vessels, and the probable length of the open navigation season through this

waterway;

The position of the Northwest, Fort William and Port Arthur being the objective point of all lines running through the wheat belt; how the situation at the head of the lakes would be ameliorated, and whether an all water route from Fort William to the seaboard for largest lake vessels would be the natural complement of the present water and rail routes;

The position of the existing and projected Gulf Lines, via Galveston, what their influence would be regarding diversion of traffic from the lakes and St. Lawrence route; the effect upon the movement of the traffic by the opening of the Hudson Bay, Pacific and Panama routes;

The conditions which exist at the Atlantic seaboard, Canadian and U. S., as to handling traffic, and ocean and insurance rates;

International trade; the facilitating of

trade between the provinces, the Northwest to supply Ontario, Quebec and the Maritime Provinces with wheat at a cheaper transportation rate, Ontario and Quebec to supply, in return, the product of their manufactures, whilst it will perhaps be possible for Nova Scotia to supply coal to some Ontario points, at a cheaper freight rate than it now costs to bring it from the U. S., effecting a great saving to the country; the iron industry and other mineral resources; the deep waterway as a factor in their development; pulp industry and the possibility of development; the tendency to manufacture at the base of supply; the possibilities along the route of the water-

way where raw material which cannot be transported by rail at a low rate is available; the easy development of water power at large dams for manufacturing purposes;

New territory opened in the Northwest and the requirements to move the grain crop in the future to open market; the cost of transporting wheat from important centres in the Northwest to the head of the lakes;

Storage at the head of the lakes and the seaboard, and extent of terminals required;

Markets, general statistics, synopsis of history of deep canals and their trade development; and generally speaking, the commercial feasibility of the proposed waterway.

Coast, Lake and River Officers for 1914.

The following appointments, made by the principal navigation companies, engaged in Canadian navigation, for their various steam vessels and tugs, for this year, have been reported to Canadian Railway and Marine World, by the managements, in addition to those published in our last issue. The first column gives the names of the vessels, the second, those of the captains, and the third those of the chief engineers:-

Table listing appointments for various companies including AMERICAN YUKON NAVIGATION CO., BOWRING BROS., LTD., BRITISH YUKON NAVIGATION CO., BUTLER FREIGHTING AND TOWING CO., CANADA CEMENT TRANSPORT, LTD., CANADA STEAMSHIP LINES, LTD., CANADA STEAMSHIP LINES, LIMITED, PASSENGER VESSELS.

Table listing appointments for various companies including Boucherville, Brockville, Cascadia, Caspian, Cayuga, Chicora, Chippewa, Corona, Kingston, Longueuil, Macassa, Modjeska, Murray Bay, New Island, North King, Quebec, Ramona, Rapids King, Rapids Queen, Rochester, Saguenay, Saronic, Syracuse, Ste. Irene, St. Lawrence, Tadoussac, Thousand Islander, Three Rivers, Toronto, Turbinia, Varuna, CANADIAN LAKE AND OCEAN NAVIGATION CO., CANADIAN PACIFIC RAILWAY, BRITISH COLUMBIA COAST SERVICE, VICTORIA, B.C., EASTERN MANITOULIN ROYAL MAIL STEAMSHIP LINE, GRAND TRUNK PACIFIC COAST STEAMSHIP CO., GRAND TRUNK RAILWAY DETROIT RIVER CAR FERRIES, HAVRE STEAMSHIP CO., THE LEVIS FERRY, LTD., MERCHANTS MUTUAL LINE, LTD., MIDLAND TRANSPORTATION CO., LIMITED.

Table listing appointments for various companies including THE MIRAMICHI STEAM NAVIGATION CO., MONTREAL TRANSPORTATION CO., NATIONAL STEAMSHIP CO., LTD., PEMBROKE TRANSPORTATION CO., LTD., PENINSULA TUG AND TOWING CO., PORT HURON AND SARNIA FERRY CO., SINCENNES-McNAUGHTON LINE, TEMISKAMING NAVIGATION CO., LTD., THREE RIVERS STEAMSHIP CO., UPPER OTTAWA IMPROVEMENT CO., MESSUREMENT FEES ON VESSELS FOR REGISTRATION PURPOSES.

Investigation Into the Stranding of the s.s. Cobequid.

Commander H. St. G. Lindsay, Dominion Wreck Commissioner, assisted by Captains Neil Hall and J. W. Harrison, as assessors, held an investigation at Halifax recently into the stranding of the British steamship Cobequid, formerly Goth, official no. 98,866, on Trinity Ledge, Bay of Fundy, Jan. 13, owned by the Royal Mail Steam Packet Co., of London, and engaged in the Canadian-West Indian mail service, during a voyage from Demorara and way ports to St. John, N.B., with a full cargo and 11 passengers, and mails, sailed from Bermuda on Jan. 9, 1914. Everything appears to have gone well during the run from Bermuda and good observations were apparently obtained at noon of Jan. 12, but as all the ship's logs, books, notes and charts were lost, no written record of the positions was available at the investigation, although the course and distance to a position 10 miles south of Seal Island light was given as north 6° west true, distance 96 miles. Seal Island Light was sighted about 10.39 p. m. on Jan. 12, and at 10.53 p. m. a cross bearing of Seal Island light and the Blonde Rock lighted buoy was obtained, and at 11 p. m., the course was altered to N 40° W (true), apparently with the idea of making the Yarmouth Fairway lighted buoy. At 12.55 a. m. of Jan. 13, Seal Island light bore east (true) distance about five miles. Shortly after this the weather became thick with heavy snow squalls, and the wind freshening from northwest to west northwest, to force about 8 to 9 (moderate to fresh gale). Soundings had been taken with the patent sounding machine every half hour during the night; but apparently they did not come in with the ship's assumed positions, and the log line appears to have fouled the sounding wire during the casts taken after midnight, which interfered considerably with the time of obtaining the soundings, and also must have had some material effect on the log's showing, which, under the prevailing weather conditions and the fouling, could not have been very reliable. About 4 a. m. the course appears to have been altered to N 15° E (north true), with the supposition that the ship was off the Fairway buoy, (although nothing had been sighted since losing sight of the light on Seal Island, shortly after 1 a. m.), and it also appears, with the intention of sighting Cape Fourchu light, and the vessel proceeded on that course until she struck the Trinity Ledge at about 6.05 a. m., Jan. 13. Just before she struck the master sighted the broken water ahead, and ordered the helm hard astarboard but the vessel had hardly started to swing to port when she struck the ledge and almost immediately commenced to make water fore and aft.

The fires were drawn almost at once, and within an hour of the stranding the engine room and stokehold were full of water, although all available pumps had been started immediately after the stranding occurred. The passengers and most of the crew were taken off the wreck by the small coasting steamship Westport on the evening of Jan. 14, after suffering great hardships during the whole 36 hours, having been forced by the rising tide to take shelter in the master's room and ladies' cabin, which were situated on the upper deck, being the only place available above water, and without heat, and practically without food, and were ultimately landed in Yarmouth, N. S., that night. The master and several members of the crew remained on board until the following morning, on account of the boats not being able to return from the rescuing steamer, having

been damaged alongside of her, and darkness coming on. They were then taken off by one of the Canadian Government steamships, and landed at St. John, N. B. The ship and cargo are considered to be a total loss.

The court is unanimous in its opinion that the stranding and ultimate loss of the Cobequid was caused by the grave error of judgment of John Howson, the master, inasmuch as when at 4 a. m. on the day of the stranding, he saw that the weather conditions at that time were so bad, and likely to last, and with a strong gale blowing on to the land, he was not justified in attempting to pass inside of the Lurcher Shoal, especially as he was practically ignorant of the conditions of the tidal streams in that locality, and in the court's opinion should have hauled his vessel out to the westward, into deep water, where there was ample sea room to handle her until such time as the weather cleared, or he was able to proceed with safety, and he was not justified in assuming that the Lurcher light vessel was not on her station on the morning of the stranding, simply because she happened to be away from it, undergoing the usual annual repairs and overhauling, when he passed down the Bay of Fundy in Nov., 1913, as she is a permanent aid to navigation, as is shown in the list of lights, etc., and on the Admiralty charts, and was on her station at that time. The court therefore severely censures the master; but on account of the very efficient and satisfactory manner in which everything was carried out on board his ship for the safety of the passengers and crew, after the stranding, does not deal with his certificate. It was unfortunate that the master was unable to give the exact position of his vessel by wireless when she stranded, although under the weather conditions it would not appear that a rescue could have been effected much before the time when it actually occurred.

Icebreaking Steamship for the St. Lawrence River.

We are officially advised that the contract for the construction of a large icebreaking steamship for the St. Lawrence River service has been awarded to Canadian Vickers, Ltd., Montreal, for \$998,593. Delivery is to be made by the fall of 1915. The chief dimensions are: length, 292 ft.; length between perpendiculars, 275 ft.; breadth moulded at low water line, 56 ft.; breadth in extreme, 57 feet; depth moulded, 32 ft.; draught, mean, 19 ft.; horse power, 8,000.

Designs have been prepared by Chas. Duguid, Naval Constructor for the Department of Marine, and it is intended to have this vessel one of the most modern icebreakers in the world. It is announced that work will be commenced on her during June, and the builders are pushing forward construction of the necessary buildings, etc., at their plant at Maisonneuve. All the materials which it is possible to obtain in the Dominion will be so purchased, but it is said that the boilers and machinery for the vessel will be built at the works of Vickers, Ltd., in England, as the complete machinery and boiler plants at Maisonneuve cannot be finished in time for the equipment of the vessel with locally made machinery. P. L. Miller, Manager, Canadian Vickers, Ltd., was, before his present appointment, attached to the Royal Corps of Naval Constructors.

The G. T. Pacific Coast Steamship Co.'s s.s. Prince Rupert has been replaced on her route, after having completed her annual overhaul at Esquimalt.

The Abolition of the North Sydney Harbor Commission.

The Minister of Marine in introducing a bill in the House of Commons recently providing for the transfer to the Crown of the property and rights vested in the North Sydney Harbor Commissioners, stated that for a number of years past, representations had been made to the department by those interested in the welfare of the shipping at that port, that no useful purpose was served by the commission and that it should be abolished and the harbor managed as are many other harbors in the Dominion, by the Marine Department, through a harbor master. It was pointed out, and in the Minister's opinion, established, that the tolls charged by the commission, for shipping entering the harbor, was in the nature of a discrimination against the harbor, and from which no advantage was derived. The commission was authorized to collect dues from all registered vessels of 40 tons and upwards, at the rate of 1c. a ton. The total revenues collected in 1912 were \$3,917.60, and of this amount, \$1,637 was paid as salaries to commissioners and harbor masters, and practically the whole of the balance was expended on repairs to the breakwater at the north bar. Vessels at Sydney are exempt from such dues, and it is contended that shipping at both ports should be placed on an equal footing. The liabilities of the commission are placed at about \$800, and the assets are of considerable value. Under the proposed legislation the liabilities will be taken over with the assets, and the management of the harbor placed under the Marine Department. A harbor commissioner will be appointed and paid, as other harbor commissioners are, by commission on dues collected, to a specified amount, and it is proposed that the legislation shall become effective, Jan. 1, 1915.

In the discussion which followed the Minister's remarks, it was stated that the dues as now existing, will be abolished, and the shipping placed on exactly the same footing as that entering Sydney, where sick mariners' dues, and others of a similar nature are paid, and from which the harbor commissioner will be paid, as provided by the Harbor Commissioners Act.

The rates charged at Sydney, and which will be adopted at North Sydney, are as follows:—For vessels up to 50 tons register, 50c.; from 50 to 100 tons, \$1; 100 to 200 tons, \$1.50; 200 to 300 tons, \$2; 300 to 400 tons, \$2.50; 400 to 500 tons, \$3; 500 to 700 tons, \$4; over 700 tons, \$5. Collections will only be made twice on the same vessel in any one year. It is proposed that the act shall become effective Jan. 1, 1915.

Shipping Statistics for 1913. The statistics of shipping, which have been submitted to the House of Commons, show that during 1913, there were 8,545 vessels on the Canadian register, valued at \$26,908,950. The total tonnage was 896,965 tons, and 43,968 persons were engaged in the marine service. Of the total number of vessels registered, 3,847 were steam, with a tonnage of 711,512. The value of new vessels, of which there were 344, added during the year, was \$1,808,380.

R. E. McDonald, Local Manager, Pacific Coast Steamship Co., Vancouver, is reported to have stated recently that the statement appearing in the press to the effect that the Company proposed to abandon its summer tourist service to Alaska, is erroneous. The service will commence June 13 and continue until Aug. 18, the steamships City of Seattle and City of Spokane being utilized.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

88. Mar. 23. Ontario, Georgian Bay, Byng Inlet, buoyage, day beacons.
 89. Mar. 24. New Brunswick, south coast, Bay of Fundy, off Negro Head, submarine bell buoy to be discontinued.
 90. Mar. 24. New Brunswick, south coast, Bay of Fundy, approach to St. John, submarine bell buoy to be moored near Black Point gas and whistling buoy.
 91. Mar. 24. New Brunswick, St. John River, Milkish Inlet, McColgan Point, lighthouse established.
 92. Mar. 24. New Brunswick, St. John River, Milkish Inlet, Bayswater, lighthouse and fog bell established.
 93. Mar. 24. Nova Scotia, Madame Island and Gut of Canso, change in names of light stations.
 94. Mar. 24. Quebec, River St. Lawrence below Quebec, Berthier-en-bas, dredging.
 95. Mar. 25. Nova Scotia, Bay of Fundy, Ile Haute, hand fog horn at light station.
 96. Mar. 25. Nova Scotia, south coast, submarine bell buoy to be moored near Brazil Rock gas and whistling buoy.
 97. Mar. 25. Nova Scotia, south coast, Lunenburg Bay, Sculpin shoal, bell buoy to be replaced by gas and bell buoy.
 98. Mar. 25. Quebec, River St. Lawrence, Les Mechins, pole light on wharf, correction.
 99. Mar. 25. Quebec, River St. Lawrence, Lark reef, change in color of gas buoy light.
 100. Mar. 25. Quebec, River St. Lawrence below Quebec, off Grande Pointe, change in color of gas buoy light.
 101. Mar. 25. Quebec, River St. Lawrence, north channel, eastern narrows of North Traverse, change in color of gas buoy light.
 102. Mar. 27. Quebec, River St. Lawrence, Lake St. Francis, upper entrance to the Soulanges Canal, gas buoy to be placed temporarily, change in position of gas buoy.
 103. Mar. 27. Quebec, River St. Lawrence, Lake St. Francis, Port Lewis, gas buoy withdrawn.
 104. Mar. 27. Ontario, River St. Lawrence, Glengarry Point, light discontinued.
 105. Mar. 27. Ontario, Lake Erie, Port Colborne and its approaches, Port Burwell, Port Stanley, and entrance to Rondeau harbor, plans issued.
 106. Mar. 27. Ontario, River St. Mary, westward of Vidal shoals, gas buoy to be established at junction of channels.
 107. Mar. 27. Ontario, Lake Superior, head of River St. Mary, Gros Cap reefs, gas and bell buoy to be established.
 108. Mar. 27. United States of America, Lake Erie, Detroit River mouth, Detroit River light station, characteristic of light to be changed.
 109. Mar. 28. British Columbia, Chatham Sound, Metlakatla Bay, Alford reefs, gas buoy to be withdrawn.
 110. Mar. 28. United States of America, Juan de Fuca Strait, Ediz Hook light station, intended change in character of light.
 111. Apr. 3. Quebec, River St. Lawrence, Cape Salmon light station, intended change in character of light.
 112. Apr. 3. Manitoba, Hudson Bay, Port Churchill, Esquimaux beacon destroyed by storm.
 113. Apr. 3. Ireland, west coast, Clew Bay, Clare Island, alteration in character of light.
 114. Apr. 7. British Columbia, list of buoys, beacons and day marks on the Pacific coast of Canada, third edition.
 115. Apr. 7. British Columbia, Vancouver Island, east coast, Kelp Bar, gas and bell buoy to be withdrawn.
 116. Apr. 7. British Columbia, Cordero

Channel, northward of Erasmus Islands, unchartered rock.

117. Apr. 7. British Columbia, Fitzhugh Sound, Addenbrooke Island, lighthouse and fog bell established.

118. Apr. 9. Ontario, Lake Erie, Kingsville light station, hand fog horn established.

119. Apr. 9. Ontario, Georgian Bay, Giants Tomb Island, Bennet Bank, gas buoy to be replaced by gas and bell buoy.

120. Apr. 9. Ontario, St. Joseph channel, Hilton, dredging.

121. Apr. 9. Ontario, St. Joseph channel, Walker River, dredging.

122. Apr. 14. Nova Scotia, south coast, Mahone Bay, Princess Inlet and approach, list of buoys.

123. Apr. 14. Nova Scotia, south coast, Musquodoboit Inlet, buoys established.

124. Apr. 14. Nova Scotia, Cape Breton Island, east coast, St. Ann harbor entrance, buoyage.

125. Apr. 15. British Columbia, Prince Rupert harbor, hydrographic notes.

126. Apr. 17. Ontario, Lake Erie, Pelee Passage, wreck northwestward of lighthouse, gas buoy to be placed temporarily.

127. Apr. 17. Ontario, Lake Huron, Goderich, change in character of light.

128. Apr. 18. New Brunswick, south coast, Bay of Fundy, Musquash, intended change in character of light.

129. Apr. 18. New Brunswick, south coast, Bay of Fundy, Quaco light station, intended change in character of light.

130. Apr. 20. New Brunswick, Bay of Fundy, east of Deer Island, Sandy Island ledge, spindle erected.

131. Apr. 20. New Brunswick, Bay of Fundy, east of Deer Island, ledge north-eastward of Tinker Island, spindle erected.

132. Apr. 20. Nova Scotia, north coast, Northumberland Strait, entrance to Pictou, position of Skinner reef gas and bell buoy, correction.

The Wreck of the Bridgeport.—In answer to questions in the British House of Commons recently, in connection with the loss of the Dominion Coal Co.'s s.s. Bridgeport, the President of the Board of Trade stated that the vessel which left Sydney, Nov. 1, for Montreal had not since been heard of. As at the time of the loss and for some months previously, she had been trading on the Canadian coast, the Canadian courts, which will hold an investigation, are in a much better position to secure material information regarding the casualty than could a court of investigation in Great Britain. The President was unable to say if the statements reported to have been made by officers of the vessel in communications to their relatives, as to the condition of the vessel at various times, were correct, but if any statements bearing on the condition of the vessel, or on its loss, can be supplied to the Board of Trade, they will be forwarded to the Canadian authorities, to whom certain information has already been sent. The statements alluded to are chiefly to the effect that when the vessel arrived at Sydney, N. S., May 23, 1913, her 'thwartship beams were put ashore to facilitate working of the cranes, and were left there; that on the voyage of Sept. 8, at Montreal, the vessel's cargo was 11,600 tons on a draught of 26 ft. 11 ins., whereas her builders gave her deadweight capacity as 11,000 tons on a draught of 25 ft. 1 3/8 ins.; that the compass had shifted a point owing to the change of derricks, and was thus the cause of the vessel being put on a wrong course. She was built in Great Britain, and was owned there, being under charter to the Dominion Coal Co. The officers and crew were also from Great Britain.

New Ferry Boat for Montreal-Longueuil Service.

The Canadian Steamship Lines, Ltd., has ordered from G. T. Davie & Sons, Levis, Que., a single screw ferry boat, to be called Longueuil, and to replace the present boat of that name. Her dimensions will be:—length over all, 169 1/2 ft.; extreme beam, 43 ft. 2 1/2 ins.; depth moulded, 12 1/4 ft. She will have one Scotch marine boiler, and the engine will be fore and aft compound, 17-34 ins. by 36.

She will be built to Lloyds requirements, and will be constructed suitably for ice breaking conditions. She will be practically fire proof, all decks and superstructure being of steel. She will be fitted with all conveniences, and will be of a type representing the most modern ideas in ferry steamboat building.

The machinery to be installed in this vessel, is being transferred from the company's s. s. Dundurn, which has been dismantled at Polson Iron Works, Toronto.

Marine Engineers Ask for Higher Pay.

Midland (Ont.), Council No. 12, National Association of Marine Engineers of Canada, has issued the following circular letter to vessel owners on the Great Lakes, etc.:—“Wages of mechanical engineers have increased very little in the past 10 years, while wages in other trades have advanced very considerably. The cost of living has become much higher, many necessities of life being 100% higher than they were 10 years ago. There is not sufficient inducement to young men to become marine engineers, and, consequently, the number of capable men will soon become far less than the demand. Our duties and responsibilities are increasing, while our salaries are not. We ask for either chief or second engineers an increase for 1914 of at least 10% over 1913.”

Great Lakes Transportation Co., Ltd., has been incorporated under the Dominion Companies Act, with an authorized capital of \$1,000,000, and office at Midland, Ont., to own and operate steam and other vessels and carry on a general navigation business. The incorporators are:—H. W. Richardson, Kingston; James Playfair, D. L. White and F. W. Grant, Midland; and W. J. Sheppard, Waubaushe, Ont. H. W. Richardson is a member of the firm of John Richardson and Son, Ltd., Kingston, which owns a number of grain carrying vessels. James Playfair was Vice President and Managing Director, Richelieu and Ontario Navigation Co., prior to the sale of the properties to Canada Steamship Lines, Ltd. He played a prominent part in the various amalgamations and absorptions leading up to the formation of that company, commencing with the acquirement of the vessels and navigation properties of R. O. and A. B. Mackay, Hamilton, which, with the Midland Navigation Co., and the Empress Transportation Co. of Midland, formed Inland Lines, Ltd., and following on through the negotiations covering the control of the Northern Navigation Co., and the acquirement of the Niagara Navigation Co., and all the various constituent parts of the completed amalgamation. W. J. Sheppard was President of the Northern Navigation Co. for several years prior to its sale to the Richelieu and Ontario Navigation Co.

The engagement is announced of R. H. WHITE, Managing Engineer Marconi wireless telegraph station, Glace Bay, N.S., to Miss J. Henshaw, of Stoke-on-Trent, Eng.

Atlantic and Pacific Ocean Marine.

The White Star Line is reported to have placed an order for the building of another vessel of the Adriatic type, with a displacement of 33,000 tons.

F. S. Appleby, for the past eight years Agent, Allan Line Steamship Co., Winnipeg, resigned, Mar. 31, to return to Leeds, Eng., where he will open a general steamship and immigration office.

The Cunard Steamship Co. has declared a dividend of 10% for the year ended Dec. 31, 1913. The annual report showed profits of \$6,383,975, including \$444,820, brought forward from 1912.

The C. P. R. s.s. Montreal from Antwerp to St. John, N.B., put in at Halifax, N. S., Apr. 3, having had her rudder post broken during a storm. The steering for the last 400 miles was done by means of the propellers.

The Allan Line s. s. Alsatian, which sailed from Halifax, N. S., Mar. 28, arrived at Liverpool, Eng., Apr. 3, having completed the voyage in 5 days 20 hours, which is considered a remarkable performance, seeing that she took a more southerly, and therefore longer, route than is usual.

The passenger traffic of the White Star-Dominion, Canada, and Austro-American Lines, which has hitherto been jointly managed by P. V. G. Mitchell and R. F. Macfarlane, Montreal, will in future be in charge of the former, Mr. Macfarlane having retired, after 40 years service.

The Allan Line has announced that its new steamships, Alsatian and Calgarian, will make Quebec their Canadian terminal port instead of Montreal, owing to the lack of depth in the channel between Quebec and Montreal. The Calgarian is due at Quebec, May 8, and the Alsatian, May 22, on their first trips up the St. Lawrence.

The Royal Mail Steam Packet Co. is fitting out the s. s. Chaudiere for service between the Maritime Provinces and the West Indies, to take the place of the wrecked s. s. Cobequid. The Chaudiere was built in 1899, is 3,986 tons gross, driven by twin screws, and is equipped with all the latest devices for handling cargo for the West Indies trade. She will have accommodation for 50 saloon, 80 second and 120 third class passengers.

It was announced in Montreal, Apr. 18, that the C. P. R. had decided to make calls at Manila, Philippine Islands, commencing June 11, the s. s. Empress of Russia being the first vessel calling there. The time taken on the voyage from the Canadian port to Manila will be 17 days, against 28 days previously taken by vessels from any North American port. It is stated that the service is being inaugurated after urgent requests by large commercial interests in the U. S.

The Dollar Steamship Co. is having another steamship built in Scotland, to be named Harold Dollar. It is stated that she will, as have other vessels of the same ownership, be placed on the British register. Robert Dollar, the head of the company, is reported to have stated recently that the new vessel will cost about \$280,000, and that to build a similar vessel in the U. S. would cost about \$600,000, and then it would not be as good. He also compared the advantages of having the vessels operated under the British regulations, as against those of the U. S.

The Roth Line has decided to enter the Canadian trade, and will run a freight service between Montreal and Antwerp, the steamships Boldwell and Coningsby being utilized in the service, sailing from Antwerp, Apr. 20 and May 1, respectively.

It is said that the service will be operated in connection with the Grand Trunk and other railways, and will be outside the North Atlantic Freight Conference. The report also states that a ten year contract has been entered into with a European firm for cargoes of pulpwood eastbound. T. Harling, 407 Board of Trade Bldg., Montreal, is the Canadian agent.

It is announced from Ottawa, that carrying out its part of the agreements arrived at by the recent marine convention in London, Eng., the Marine Department is co-operating with the U. S. Government, which latter has two vessels patrolling the North Atlantic route making observations and reports regarding ice conditions. An officer is to be placed at Cape Race, and all reports as to the position of ice and icebergs will be sent to him. Two wireless telegraph messages will be sent out from that point each day giving all vessels at sea, information as to the ice, and during the period between June and October, similar information will be dispatched from the station at Belle Isle.

The Allan Line s. s. Calgarian, which has recently been completed at Glasgow, Scotland, underwent her trials during March. The speed trials consisted of seven double runs on the measured mile, commencing at 11 knots and increasing gradually to full speed. On the last run, the mean speed was 20.634 knots, which is about 1½ knots more than she will be required to do on regular service. The propelling machinery consists of four Parsons type turbines, supplied with steam by six double ended and four single ended boilers placed in two separate compartments, equipped with Howden's forced draught. The port wing shaft is driven by a high pressure turbine exhausting into an intermediate pressure turbine driving the starboard wing shaft. The two inner shafts are each driven by a low pressure turbine, and a powerful astern turbine is placed in the same casing. The passenger accommodation is arranged for 200 first class, 400 second class and 1,000 third class, and in addition a crew of about 450 will be carried.

Maritime Provinces and Newfoundland.

The Governor General in Council has approved of the bylaws of the Pilotage Commissioners for the pilotage district of Shepody Basin, N. B.

The car ferry steamship which is being built at Newcastle-upon-Tyne, Eng., for service between Cape Tormentine, N. B., and Carleton Point, P. E. I., will probably be launched in June.

The Minister of Public Works, in response to the representations of a deputation from Charlotte county, N.B., recently, promised that the next estimates would include an amount for the development of the St. Croix River for harbor purposes.

Furness Withy and Co. have announced the withdrawal of their s.s. Swansea Trader, which has been running for some time between Halifax and Charlottetown, P.E.I. The vessel is to return to England, and it is not the company's intention to resume the service. They have decided to withdraw entirely from the coastwise trade.

The Dominion Government Customs patrol steamship Margaret arrived at Halifax, N. S., from England, April 13, after a stormy passage, occupying 19 days. She was fully described in Canadian Railway and Marine World for Dec., 1913, and a preliminary description with outline illustration was given in our issue of Sept., 1912.

Harbor improvement work has been recommenced at West St. John, and it is announced that two additional steamship

berths will be completed and ready for occupation by Dec. 1. The Public Works Department has requested the City Council to send in its plans of the area for the two steamship berths which it wants the Government to build on the eastern side of the harbor.

The New Brunswick courts have issued an order for the winding up of the May Queen Steamship Co., of Gagetown, on the ground that 25% or more, of the capital stock has become impaired, or lost, or unavailable, and for other reasons. It was stated that the s.s. May Queen is practically the only asset. There is a first mortgage on the vessel for \$13,000 and a second mortgage for \$2,000, and in evidence it has been stated that the saleable vessel is not worth more than \$10,000.

Province of Quebec Marine.

The Governor General in Council has approved of the Quebec Harbor Commissioners' bylaws, which were recently revised and amended.

The actual construction and equipment work on the Quebec Harbor Commissioners' elevator at the Louise docks has been completed, and the structure handed over to the Commissioners by the contractors, Canadian Stewart Co. Work was commenced in March, 1913.

The Marine Department will receive tenders to May 4, for the construction of a steel single screw hopper barge, to be delivered at Sorel, Que. Each tender must be made with the distinct understanding that the barge must be built in Canada.

H. M. Cameron, who has been appointed manager of the shipyard, Canadian Vickers, Ltd., Maisonneuve, Montreal, and who has been in the service of Vickers, Ltd., and its predecessor, for 23 years, was entertained by the officials at Barrow in Furness, Eng., and presented with a number of articles before leaving there for Montreal.

La Compagnie de Navigation St. Laurent-Richelieu, Ltd., has been incorporated under the Dominion Companies Act, with \$90,000 capital, and office at Montreal, to own and operate steam and other vessels, and carry on a general navigation business. A Lamothe, E. Charron, St. Denis, Que., and L. Morin, A. D. Denis and L. A. Beriau, Montreal, are the incorporators.

The Public Works Department has completed dredging on both sides of the head of the pier at Pointe Verte, Trou de Berthier, to allow of vessels lying along either side, with a minimum depth of 10 ft. at low water. On the west side of the pier, the basin is 200 ft. long by 150 ft. wide, and on the east side, 175 ft. long by 100 ft. wide, and there is 17 ft. of water along the outer face.

The National Navigation Co., Ltd., of Quebec, which is in liquidation, will not, we are officially informed, resume business. The company owned the steamship Natashquan, formerly Polino, built in Sunderland, Eng., in 1870. She is screw driven by engine of 98 n.h.p., and is of the following dimensions, length 198.7 ft., breadth 27.3 ft., depth 15.5 ft.; tonnage, 991 gross, 642 register. She will be sold by the liquidators but no offers have been received.

The improvements in Quebec harbor for 1914, as outlined by the Harbor Commission, involve an expenditure of approximately \$2,273,559. The work comprises the dredging of a trench for a quay wall and channel approach, extension to the Louise embankment, railway and delivery yard extensions, trackage for new grain elevator, trackage for bulkhead shed in connection with car ferry terminals, purchase of Indian Cove,

purchase of four locomotives, grain loading galleries, purchase of 100 scows, and completion of retaining wall at Lampson's Cove for 1,400 ft.

A deputation representing Quebec and Levis Boards of Trade waited on the Postmaster General, Apr. 11, with the view of urging the Government to grant a subsidy for the establishment of a ship building plant at Levis. In reply, the Postmaster General stated that he did not think it reasonable to ask the Government to subsidize such a project. The shipbuilding yard would be a paying proposition, and could be run successfully by any enterprising company. The dry dock which had been commenced there was going to be a large expense to the Government, and would not be a paying business. The Government intended to encourage local shipbuilding, and all future contracts for building vessels, whether executed by Canadian or foreign companies, would have to be carried out in the Dominion. There was no intention of subsidizing outside millionaire concerns who wished to come into competition with the Canadian trade. It was also the intention shortly to call for tenders for the building of two hopper barges, which were to have been built at the Government yards at Sorel.

Ontario and the Great Lakes.

The Brockville Transportation Co.'s s. s. Senator Derbyshire has had a new Scotch boiler, 13 by 11 ft. fitted, by Polson Iron Works, Toronto.

Capt. Wm. Allen, a well known Great Lakes mariner, died at Ford, Ont., Apr. 20, aged 83. He came to Canada from England in 1839, in a sailing vessel.

Canada Steamship Lines, Ltd., which acquired the s.s. Geronia, when it took over the Ontario and Quebec Navigation Co., has changed the name of the vessel to Syracuse.

The Port Huron and Sarnia Ferry Co.'s ferry steamboat Grace Dormer was found to be on fire, Apr. 12, and was considerably damaged. The fire was caused by the watchman overturning a lamp.

The Niagara, St. Catharines and Toronto Navigation Co.'s s.s. Dalhousie City was the first vessel to enter Toronto harbor this season, arriving from Port Dalhousie, Apr. 4. The captain was awarded the usual silk hat by the harbor master.

The Keystone Transportation Co. of Canada's s. s. Keynor was launched at Londonderry, Ireland, Apr. 7, and is expected to sail for Canada about the middle of May. She will be in charge of Capt. Wm. Timmouth.

The C. P. R. Upper Lakes Service s. s. Manitoba has been thoroughly overhauled at Collingwood, and has been fitted with new boilers and steam piping, as well as new weather bulwarks forward, new hawse pipes and stockless anchors.

H. H. Gildersleeve, Manager, Northern Navigation Co., Sarnia, is reported to have stated, Apr. 8, that the headquarters for the company's Georgian Bay service will be Owen Sound in future, instead of Collingwood, the latter place, however, remaining as a port of call.

A small steamboat has been completed at Collingwood, recently, for missionary work at Herschel Island, near the mouth of the Mackenzie River, and has been shipped by rail to Athabasca Landing, Alta., whence she will proceed by water. She has been named Atkoon.

The Public Works Department has awarded the contract for Sec. 2 of the Trent Canal, being the portion between Lake Simcoe and

Georgian Bay, to the Inland Construction Co., Toronto, the amount approximating \$712,260. The contract for the Severn River section has been awarded to the York Construction Co., Toronto.

There are under construction at Polson Iron Works, for the Canadian Stewart Co., for harbor work at Toronto, two dredge hulls, and one steel derrick scow. The dredge hulls are each 170 ft. long, 42 ft. beam, and 12 ft. deep, and they will be equipped as 24 in. suction dredges. The scow is 140 ft. long, 40 ft. beam, and 11 ft. deep.

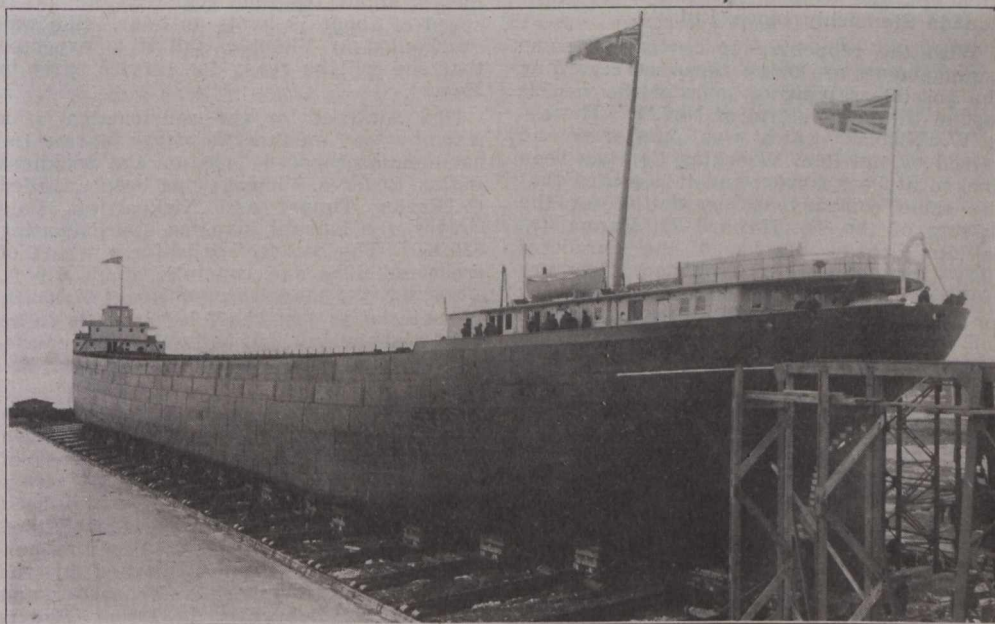
Work has been commenced on the construction of the sea wall near the mouth of the Mission River at Fort William. The contract was awarded by the Dominion Government to the Thunder Bay Construction Co. It is estimated that the work will occupy about 21 months and involve an expenditure of about \$340,000.

The Marine Department has issued a chart with plans of the harbors on Lake Erie, comprising Port Colborne and its approaches, Port Burwell, Port Stanley, and the entrance to Rondeau harbor. These have been specially prepared by the Hydrographic Survey of the Department of Naval Service.

March levels for the past ten years, Superior was 0.25 ft. above; Michigan and Huron 0.14 ft. below; Erie 0.34 ft. below, and Ontario 0.22 ft. below. It was anticipated that during April, Superior would remain stationary, Michigan and Huron would rise 0.3 ft., Erie 0.7 ft., and Ontario 0.6 ft.

Canada Steamship Lines will commence service on its Niagara Division, May 2, when the s. s. Corona will open the Niagara River season. The double service will go into effect, May 23, and during June the full service of 6 trips daily will commence, with the exception of the Sunday service, which will not be started until July. The s. s. Chicora will be placed in service about June 20 on the Toronto-Olcott Beach run. On the Richelieu and Ontario Division, between Toronto, Rochester, Thousand Islands and Montreal, a daily service will be run this season instead of tri-weekly as hitherto.

The Ontario Car Ferry Co., which, as stated in our last issue, has ordered another car ferry to operate between Cobourg, Ont., and Charlotte, N. Y., has a capital of \$500,000, of which the G. T. R. owns 2,503 shares, and the Buffalo, Rochester and Pittsburgh Ry. 2,497 shares. The officers are, President, E. J. Chamberlin, President, G.T.R.; Vice



The s.s. W. Grant Morden, Canada Steamship Lines, Ltd., just before the launching.

The Windsor and Pelee Island Navigation Co.'s steamboat Pelee has been completed at Collingwood, and handed over to her owners. She is 146 ft. long, 24 ft. beam, and built of steel throughout. The machinery consists of triple expansion engines, with cylinders 12½, 21 and 34 ins. diam., and 21 ins. stroke, developing 500 h. p. Steam is supplied by a Scotch marine boiler 12½ by 11 ft.

Canada Steamship Lines s. s. W. Grant Morden was launched at Port Arthur, Apr. 4, the christening ceremony being performed by Lady Williams-Taylor of Montreal. This vessel, details of which were given in Canadian Railway and Marine World, March, pg. 142, is the largest freighter on the Great Lakes. The record for the largest vessel was previously held by the Col. Jas. M. Schoonmaker, owned by the Shenango Steamship and Transportation Co., Cleveland, Ohio.

The U. S. Lake Survey reports the levels of the Great Lakes in feet above tidewater for March, as follows,—Superior 601.91; Michigan and Huron 580; Erie 571.46; Ontario 245.67. Compared with the average

President, W. T. Noonan, President, Buffalo, Rochester and Pittsburgh Ry.; Chairman Executive Committee, H. G. Kelley, Vice President, G. T. R.; Secretary-Treasurer, Frank Scott, Treasurer, G. T. R.; Manager, W. H. Smith, Canadian Express Bldg., Montreal.

The attempt to raise the Keystone Transportation Co.'s s. s. Keystorm, which is lying in deep water near Kingston, work on which was commenced last fall, will be resumed as soon as the weather permits. The diver who went down last year reported the vessel was in very good condition considering the time she had been under water. She was wrecked in Chippewa Bay, Oct. 26, 1912, her cargo being valued at about \$300,000. The salvage has been undertaken by A. J. Lee, Westmount, Que., with the view chiefly of developing certain of his theories as to the use of compressed air for such purposes, in an extreme case, such as the Keystorm has been decided to be.

The St. Lawrence and Chicago Steam Navigation Co.'s new freight steamship, which is under construction at Collingwood, is being built with special attention to the

hatches, and when completed, it is claimed she will be one of the staunchest vessels on the lakes. Hatches will be spaced 24 ft. centres, instead of 12 ft., and will have openings 10½ ft. in the fore and aft direction. Instead of telescopic steel covers to the hatches, 4 ins. spruce will be used, and these will be fitted inside of a patent hatch rest bar, and supported underneath by portable steel strongbacks, fitted fore and aft, and also athwartships. The hatch covers will be fastened by a patent hatch fastener having proved gripping power.

The s. s. Dundurn, owned by Canada Steamship Lines, Ltd., and which has been dismantled, will be utilized as a barge. The machinery has been transferred to the new ferry s. s. Longueuil, under construction at Levis, Que. The Dundurn was built in Detroit, Mich., in 1882, for the Pere Marquette Rd., and first named Pere Marquette, and was operated between Chicago and points on Lake Michigan. She was later bought by R. O. and A. B. Mackay, Hamilton, and run between Hamilton and Montreal, under the Hamilton and Montreal Navigation Co. Along with other of the Mackay properties, it was acquired by Inland Lines, Ltd., which was, in turn, acquired by the Richelieu and Ontario Navigation Co., now Canada Steamship Lines, Ltd.

With the reopening of navigation, some arrangements are being discussed regarding the possible salvaging of some of the vessels lost in the great storm of Nov. 9. The s. s. I. W. Nicolas, which was purchased and salvaged by the Reid Wrecking Co., has been docked at Port Huron, and it is stated that the same company is negotiating for the salvaging of the s. s. Howard M. Hanna Jr., having already purchased the cargo of 10,000 tons of coal. The underwriters are reported to have declined an offer of \$10,000 for the s. s. Charles S. Price, as she now is, and it is stated that unless a better offer is received, she will not be sold until after an examination early in the season. The owners of the John A. McGean contradict the report that they intend to search for the vessel, and state that nothing will be done unless some information is received as to the probable location of the wreck.

Manitoba, Saskatchewan and Alberta.

The name of the steamboat Mikado, no. 112,308, registered at Winnipeg in the name of S. Sigurdsson, Gimli, Man., has been changed by order in council to Grand Rapids.

A dredge, which has been under construction on the Saskatchewan River bank at Pas, Man., was expected to be completed by May 1, after which work will be commenced on two 60 yd. dump scows, all for dredging operations in the neighborhood.

A small steel steamboat has been built at Winnipeg, for Hudson's Bay Co.'s service on shallow rivers. She is 150 ft. long, with 28 ft. beam, and is being shipped to McMurray, Alta., in parts, and will be reassembled and completely fitted up there.

It is reported that the Saskatchewan Steamship and Coal Co., with head office in Minneapolis, Minn., has arranged to operate the steamboat Majestic on the Saskatchewan River between Prince Albert, North Battleford, Sask., and Edmonton, Alta. The boat is mentioned as being 192 ft. long, 46 ft. beam, with stateroom capacity for 200. It is electrically lighted, and equipped with wireless telegraphy. E. J. Newell, Minneapolis, is stated to be President of the company, and R. F. Tompkins, formerly with the Great Northern Ry., Traffic Manager.

British Columbia and Pacific Coast Marine.

The C. P. R. s. s. Princess Mary, which was docked early in the year for extensive alterations, including the addition of 40 ft. to her length, was refloated Apr. 11, and it is expected that she will be ready to leave the builders' hands about the middle of May.

The G. T. Pacific Coast Steamship Co. has been awarded \$500 salvage for rescuing a gasoline launch and 16 passengers on Nov. 9, 1913, when the vessel became disabled at the entrance to Vancouver harbor. The company claimed \$2,000, and the owners of the launch offered \$100.

We are officially advised that the two steamships which are under construction in Scotland for the C. P. R. British Columbia Coast Service, will be named Princess Margaret and Princess Irene, and not Princess Maragaret and Princess Melita, as reported in the daily press. Both of them will be ready for service by the autumn.

The Union Steamship Co. has purchased the British steamship Melmore, formerly owned by the Great Western Ry., for service on the Vancouver-Powell River run. She is about 168 tons register, and has a speed of about 11 knots an hour. She was overhauled at Victoria, and it is expected that she will be ready for service early in May.

The contract for the construction of a marine wharf on the site of the Marine Department's proposed depot on the Songhees Indian Reserve, Victoria, has been awarded to Parks, Tupper and Kirkpatrick, Vancouver, the amount involved approximating \$20,450. The contract calls for a wharf of creosoted piles and concrete, about 640 ft. long, and also the grading of about 27,000 ft. of material to the wharf level. It is to be built L shape and will be located immediately north of the Esquimalt and Nanaimo Ry. bridge.

It was reported in our last issue that the British Columbia Government had decided to order a ferry steamboat, at a cost of about \$25,000 for the ferry service across the Fraser River at Ladner. We have been officially advised that the steamboat Helen M. Scanlon has been purchased for this purpose. She was formerly owned by the Brooks Scanlon Lumber Co., Vancouver, and was built at Vancouver in 1909. She is paddle wheel driven by engine of 9 n. h. p. Her dimensions are, length 124 ft., breadth 27.2 ft., depth 5 ft.; tonnage 358 gross, 209 register.

The American Yukon Navigation Co., which supplies the White Pass and Yukon Route's direct river service between Dawson and Fairbanks, has acquired all the physical property of the Northern Navigation Co. operating between Seattle, Vancouver and Skagway, for a price reported as approximately \$2,000,000. This arrangement was considered necessary in order to care for the company's increased traffic, and will afford a direct through service for the White Pass and Yukon Route, from Skagway, Alaska, through the interior of Yukon Territory and Alaska, to St. Michael, Alaska, 2,172 miles. The American Yukon Navigation Co., Ltd., was incorporated in West Virginia, in April, 1913, to operate steamboats on the Yukon River, in connection with the British Yukon Navigation Co.'s vessels, both lines forming portions of the White Pass and Yukon Route. Two vessels were built at Seattle, and named Alaska and Yukon. After being dismantled they were shipped to White Horse, reassembled and placed in service before the close of navigation on the Yukon, last year.

Welland Ship Canal Contracts.

During 1913, Canadian Railway and Marine World published considerable information with route maps and profiles of the Welland Ship Canal, and detailed drawings of the lock construction.

The Minister of Railways and Canals, in the House of Commons recently, gave some details as to the contracts which have been awarded for the work, and which has been incorporated with the C. R. & M. W. office records, to present the information in as complete and concise a form as possible, as follows:

Section 1, from Lake Ontario, including pier and trestle work at entrance, to bridge 2, and including lock 1, about 3 miles; awarded Aug. 1, 1913; date for completion, Apr. 1, 1917; amount based on schedule rates, \$3,487,725; amount deposited by contractors, \$200,000; contractors, Dominion Dredging Co., R. Gordon Stewart, President, E. A. Larmouth, Secretary-Treasurer.

Section 2, from bridge 2 to bridge 5, about 4½ miles, including locks 2 and 3; awarded Dec. 31, 1913; date for completion, Apr. 1, 1917; amount based on schedule rates, \$5,377,185.75; amount deposited by contractors, \$150,000; contractors, Baldry, Yerburch and Hutchinson.

Section 3, from bridge 5 to about half way between bridges 9 and 10. This section covers the heaviest portion of the whole route, and includes the erection of twin guard gates at Thorold, the single lock 7, the construction of a short stretch of canal below lock 7, and also of the three twin locks 6, 5 and 4 in flight, one flight for down-bound vessels and the other for upbound, the three locks overcoming a descent of 139½ ft.; awarded Oct. 4, 1913; date for completion, Apr. 1, 1917; amount based on schedule rates, \$10,220,665; amount deposited by contractors, \$400,000; contractor, James H. Corbett.

Section 5, from just above bridge 12 to just above bridge 13, about 2¾ miles; awarded Dec. 22, 1913; date for completion, Apr. 1, 1918; amount based on schedule rates, \$1,945,788; amount deposited by contractors, \$100,000; contractors, Canadian Dredging Co., D. S. Pratt, Manager.

Tenders for section 4A of the new Welland Canal were called for up to Apr. 9, and a contract has been awarded to Maguire and Cameron for a sum aggregating about \$84,000. This section covers the building of a supply weir to the old canal, and two covered drains across the dumping ground between the present and old canals. It was the intention to make it a part of section 4, lying directly to the west of it, but it was taken out of that section and made a subsection to expedite matters.

Canadian Northern Vessels Insurance.

The Canadian Northern Ry. interests, which control the companies operating the Campanello and the Uranium, have renewed the insurance on these vessels, which are valued at about £90,000 and £40,000 respectively, but the rates have been increased. Shipping Illustrated states that the Campanello pays 7 guineas against 6½% last year, while the Uranium pays 7 guineas free of damage absolutely, compared with 6 guineas on the same terms last year.

Dr. Vrooman, in a paper read before the Royal Colonial Institute in London, Eng., recently, said that the canal will put an Alberta farmer in the summer about 7 cents a bushel nearer Liverpool and in the winter 15 cents a bushel. In other words, it will add 10 cents a bushel to the value of every bushel of grain to be grown in Alberta.

Investigation Into the Stranding of the s.s. Acadian.

Commander H. St. G. Lindsay, Dominion Wreck Commissioner, assisted by Capt. Jas. Ewart and Jas. McMaugh, as assessors, held an investigation at Toronto, Jan. 30, into the stranding of the s.s. Acadian, no. 124,258, registered in Glasgow and owned by the Canada Interlake Line Ltd., on shoals near Sulphur Island, Lake Huron, on Nov. 9, 1913. She left Cleveland, Ohio, Nov. 8, for Port Arthur, Ont., with 2,540 tons of general cargo; 200 tons of iron gas pipes were stowed on the after part of the upper deck, and 195 tons of bunker coal below, the ship's draught being 15¼ ft. forward and 16¾ ft. aft. She passed Sarnia at 8 p.m. the same day, and at 5.35 p.m. Port Huron light vessel was abeam, and the patent log steamed and set. Everything appears to have gone well during the night of the 8th and morning of the 9th, and a departure was taken from abeam of Point aux Barques light, distance 7 3-10 miles, at 3.50 a.m. on the 9th, the ship then steering N. by W. by compass, and the log showing 68 4-10 miles. The wind appears to have freshened up from the northward with snow at 8 a.m., and at noon was blowing a hard gale, with constant snow, and it appears that the steering became difficult, the ship's head falling off to the westward, bringing the wind and sea on her starboard beam, and occasionally coming right up into the wind and sea and then falling off to the eastward, bringing the wind and sea on her port beam. At 3.15 p.m., during a short clearance in the weather, land was sighted nearly ahead, and also on the port bow, the vessel's head being, it appears, at that time about N. by W. by compass. The land was recognized by the master as being Thunder Bay Island and was distant about three miles, according to his judgment. He then seems to have decided to take his vessel into Thunder Bay for shelter, and with that idea in view kept the ship away to W. S.W., and after running, as he supposed, three miles, he hauled up to N.W. ½ W., intending to proceed into the Bay and anchor; but while on that course the vessel struck and stranded on a shoal south of Sulphur Island at 4.20 p.m., where she remained with her forward holds full of water until Nov. 19, when she was towed off and ultimately taken to port of Ecorse, Mich., and placed in dry dock for repairs, which were found to be very extensive.

The court, after carefully considering the evidence adduced, is of opinion that the stranding was caused by the poor judgment of the master, inasmuch as he was not justified in assuming, in the position he was, three miles off, what he took to be Thunder Bay Island, without taking means to verify same by a cast of the lead. The events which followed show that he must have been a greater distance than that to the southward of the Island, when he decided to run into Thunder Bay to take shelter, and it was not good seamanship, under the prevailing weather conditions, to attempt to take the proposed shelter, without being perfectly assured of the ship's correct position. It is the court's unanimous opinion that, on seeing that the vessel had made a fairly good course, within a little more than half a point of her intended course from her last point of departure, viz., 7 3-10 miles off Point aux Barques light, the vessel having had sufficient steerage way to bring her up occasionally head to the wind and sea, the proper thing to do under the circumstances when he sighted the land, was to have headed her off to the eastward, and taken her out into deep water, and away from a dangerous lee

shore. The vessel, although making heavy weather, was, according to the evidence, able to weather the gale, being in good trim and condition at the time.

The court therefore severely censures the master, Robt. McIntyre, for his error and lack of judgment in trying to take his ship into Thunder Bay during thick, heavy weather, with nothing to guide him, and from a position which could not be assumed to be correct; but on account of his conduct in connection with salving and re-floating the vessel, does not deal with his certificate. The court criticizes the fact of this vessel carrying iron pipes on deck, especially at a time when bad weather was likely to be met with, and also expresses surprise that no means whatever were taken to secure the deck load. This appears to the court to be taking an unusual and improper risk, both to ship and cargo, to say nothing of the risk of life and limb to the crew. A patent sounding machine would have been invaluable on this vessel, as, from the evidence on the question of taking casts of the lead, it would appear that under the weather conditions which existed on the afternoon of the 9th, it was considered impossible to use the hand lead. The reasons alleged for this do not appear to the court to be either justifiable or in keeping with ordinary seamanship, for if it were possible and safe, as shown in the evidence, to send someone aft to read the log every hour, along the sea swept main deck, it would be quite safe and practicable to have a man lashed to the rail, on forward deck, under the bridge, who could have used the lead effectively.

The Consolidation of the Canada Shipping Act.

On the introduction of the bill for the consolidation of the Canada Shipping Act, in the House of Commons, Mar. 11, the Minister of Marine said that it had been thought desirable by the department for several years that the different acts having reference to the Canada Shipping Act, should be consolidated, with certain amendments of a more or less lengthy nature. He gave a summary of the various legislation regarding shipping, from the Imperial Merchants Shipping Act of 1854, and amendments and adaptations to Canadian conditions, to the present time, and stated that it is the intention to have the consolidated act based on the latest Imperial legislation, with such substantive alterations as may be considered necessary for the more local conditions.

Part 1 deals with the registration and classification of vessels, covering the power to appoint surveyors of vessels by the Minister, instead of, as at present, by the Governor in Council; the registration of the original managing owners of vessels, as well as changes in ownership; the licensing of such vessels as are exempt from registration; the proper national colors for Canadian vessels; Part 2 deals with the certificates of masters, mates and engineers; Parts 3 and 4 covers the legislation relating to seamen and the shipping of seamen on inland waters, and sick and distressed mariners; Part 5 deals with pilotage, the only important change proposed respecting which is one by which the Minister of Marine constitutes the pilotage authority of Canada. The intention is to have pilotage administration as one system throughout the Dominion, with local pilotage authorities, more under the Department's control than heretofore, with a more uniform administration of the law than has hitherto obtained. A provision will cover the compulsory retirement of all pilots at the age of 70, and vessels trading between Canadian ports and New York, and U. S. ports north of New York,

and between Canadian ports and San Francisco, and other U. S. ports north of San Francisco will be exempt from pilotage tolls; Part 6 covers steamship inspection, examination and licensing of engineers; Parts 8 to 18 deal, respectively, with safety, wreck and salvage, special shipping enquiries and courts, lighthouses, buoys and beacons and Sable Island, public harbors and harbor masters, port wardens, coasting trade of Canada, delivery of goods, liability of carriers by water, legal proceedings and supplemental matter.

It was decided on the second reading, Mar. 12, to refer the bill to a select committee, and to have it printed and distributed among those interested in shipping in the Dominion, in order that any objections to the provisions may be made, and to give those objecting an opportunity of appearing before the committee to state their objections.

The Proposed Dry Dock at Sault Ste. Marie.

The bylaw which was passed recently by the ratepayers of Sault Ste. Marie, Ont., to subsidize the building of a dry dock there, provides for a bonus of \$20,000 a year for 20 years, for a fixed assessment on the property for school taxes of \$750,000 for 20 years, for exemption from general taxes for five years, and for a fixed assessment of \$500,000 for general taxes for 15 years.

The agreement provides that work shall be commenced by Apr. 1, on the laying out and construction of the dry dock and ship-building plant, and the equipment is to be completed to the satisfaction of the Dominion Public Works Department so as to earn the annual Government subsidy of 3% for 20 years on an expenditure of not less than \$1,338,026.76, the whole to be completed and equipped ready for operation by Apr. 1, 1916.

The dry dock is to be built of concrete, and is to be not less than the following dimensions:—

Clear length inside gate sill	650 ft.
Clear width at gate sill	65 ft.
Width at coping level	90 ft.
Width in dock chamber at coping level	106 ft. 8 ins.
Width at sill level	93 ft. 4 ins.
Width at bottom	80 ft.
Depth on sill below ordinary low water level of St. Mary River	18 ft. 6 ins.

Payments of the corporation subsidy will be made annually on Nov. 1, the first of such payments being due on Nov. 1, 1916, provided the plant is completed and ready for operation at the time stated. The site for the plant comprises a water lot of about 5 5-10 acres.

The agreement with the city was made with F. H. Clergue, and the Lake Superior Dry Dock and Construction Co., Ltd., has been formed for the purpose of carrying on the work, the Ontario Legislature being asked to confirm the transfer of all rights under the agreement, to the company.

Steel vs. Wooden Hatch Covers. In connection with the vessel losses in the Great Lakes storm of Nov., 1913, it has been pointed out to Canadian Railway and Marine World, by a well known lake captain, that each of the vessels lost was equipped with steel hatch covers, and that none of the vessels equipped with wooden hatch covers, out in the storm, was lost. He has formed an opinion that the steel covers would be battered, or bulged in, during the storm, and the vessels flooded, but in the case of wooden hatch covers, they would not be so affected, owing to their general resiliency. Whether this be so or not, it is interesting to note that the St. Lawrence and Chicago Steam Navigation Co.'s new vessel, now being built at Collingwood, Ont., is having its hatch covers built of 4 in. spruce instead of steel.

Dominion Government Radiotelegraph Station.

The Department of Marine has issued a list of all the Government radiotelegraph stations on the Atlantic and Pacific coasts and the Great Lakes, which it has installed to date. All these stations work on a wave length of 600 metres. Charges on all messages to and from vessels are computed by the cable method of counting, with a minimum charge per message equal to a charge for 10 words. All Government messages, or those relating to weather conditions, and similar information covering the navigation of the vessel, are dealt with without charge. The various stations are located as follows:—

Atlantic Coast, the Gulf and River of St. Lawrence up to Montreal—Partridge Island, St. John, N.B.; Cape Sable, N.S.; *Camperdown, N.S.; *Sable Island, N.S.; *North Sydney, N.S.; Cape Race, Nfld.; Cape Ray, Nfld.; Grindstone Island, Magdalen Islands; Cape Bear, P.E.I.; *Pictou, N.S.; Belle Isle, Nfld.; Point Amour, Labrador; Point Rich, Nfld.; Harrington, Que.; Heath Point, Anticosti; Fame Point, Que.; Clarke City, Que.; Father Point, Que.; Grosse Ile, Que.; Quebec, Que.; Three Rivers, Que.; Montreal.

Great Lakes and Connecting Waters—Barrie Common, Kingston, Ont.; Toronto; Port Burwell, Ont.; Point Edward, Ont.; Tobermory, Ont.; Midland, Ont.; Sault Ste. Marie, Ont.; Port Arthur, Ont.

Pacific Coast—Estevan, B.C.; Pachena, B.C.; Gonzales Hill, Victoria, B.C.; Point Grey, B.C.; Cape Lazo, B.C.; Alert Bay, B.C.; Triangle Island, B.C.; Ikeda Point, B.C.; Deadtree Point, B.C.; Parizeau Point, Prince Rupert, B.C.

The stations marked with an asterisk are owned and operated by the Marconi Wireless Telegraph Co. of Canada; all those on the Great Lakes and connecting waters are owned by the Government and operated by the company, and those on the Pacific coast are both owned and operated by the Government. The station at Kingston, Ont., which is being equipped will, it is expected, be put into operation on the reopening of navigation.

Telegraph, Telephone and Cable Matters.

The Newfoundland Legislature has authorized the issue of \$140,000 of debentures, to provide for the extension of the telegraph system in the colony.

The laying of one mile of cable between Welcome Pass and Thormandy Island, at Buccaneer Bay, B. C., was completed, Apr. 9, and connection made with the land lines of the Dominion Government telegraph system.

The Great North Western Telegraph Co. has opened offices at Fonthill and Lyn, Ont., and has closed its offices at Bridgeport, Ont., and Phillipsburg, Que. The name of the office at Salmon Lake, Que., has been changed to Lac au Saumon.

The estimates recently passed in the House of Commons, cover work on telegraph lines in the various Provinces, as follows,—Cape Breton lines, N. S.; general improvements in P. E. I.; Bay of Fundy system, and betterment of service between Grand Manan, Campobello, N. B., and Eastport, Me.; improvements and extensions in Quebec; line from Athabaska Landing to Lac la Biche, Peace River line, and Qu'Appelle-Edmonton line, Sask. and Alta.; Clayoquot line, repoling Ashcroft-Quesnelle line, and general improvements on telegraph and telephone lines in B. C.; and Government telegraph lines generally.

In a recent lecture given at London, Eng., by Richard Kerr, the title of "Father of Wireless Telegraphy" was given to Jas. B. Lindsay, who was born in 1799 and died in 1862. This man, a not too prosperous schoolmaster at Dundee Jail, with a salary of £50 a year, made his own batteries and coils and sent wireless messages across the Tay and other Scottish rivers and lakes as well as across the Solent. He is said to have declared that if he only had the means to extend his experiments there was no reason why he could not send messages across the Atlantic. It was essential to the Lindsay system that there be a stretch of water between the transmitter and the receiver.

Trade and Supply Notes.

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

The Canadian General Electric Co. has issued bulletin A4199 dealing with railway motor gears and pinions.

Hunt-Spiller Manufacturing Corporation, Boston, Mass., has appointed as its representative Elbert J. Fuller, who resigned a position on the Chicago and North Western Ry. to enter the Hunt-Spiller service.

Goldschmidt Thermit Co.—Reactions, the Goldschmidt Thermit quarterly publication, contains a number of descriptions of the various types of breakage for which thermit can be used with advantage, most of them being well illustrated. One of the repairs described is the welding of a broken rudder on the Dominion Coal Co.'s steam tug D. H. Thomas.

United States Light and Heating Co.—The Chicago branch sales office has been moved from 1013 People's Gas Building to 2335 State St. This change brings the Chicago sales office and service station into the same building. The railway department of the Chicago office is now under H. A. Matthews; R. E. Stuntz has charge of the battery and starter department, and the service department is being looked after by H. H. Emerson.

The Titanium Alloy Mfg. Co., Niagara Falls, N.Y., has issued Mail Reports, Bulletin 5, Open Hearth, containing extracts from a paper presented at the International Congress, for Testing Materials in 1912, by Robt. W. Hunt, giving analyses of segregated rails, a summary of chemical and physical results as reported in bulletins 1, 2, 3, 4 and 5, on standard open hearth A rails, and titanium treated open hearth A rails, a report by G. F. Comstock and a large number of illustrations of rail sections reproduced from photographs, with accompanying analyses, etc.

Hudson Bay Navigation.—The Minister of Marine announced in the House of Commons, recently, that the Lighthouse Board had decided to place 12 lights and 15 additional buoys between Hudson Bay Straits and Port Nelson, and that the Dominion Government s. s. Minto would leave as soon as possible to place them. He also stated that an amount in the naval service estimates would be devoted to the erection of a wireless telegraph station at some point along the straits.

Transportation Conventions in 1914.

- May —.—Association of Railway Claim Agents, St. Paul, Minn.
- May 5-8.—Air Brake Association, Detroit, Mich.
- May 13.—Freight Claim Association, Galveston, Texas.
- May 18-20.—Railway Storekeepers' Association, Washington, D.C.
- May 18-22.—International Railway Fuel Association, Chicago, Ill.
- May 19.—American Association of Demurrage Officers, St. Louis, Mo.
- May 20-22.—Freight Claim Association, Galveston, Texas.
- May 20-23.—Association of Railway Telegraph Superintendents, New Orleans, La.
- May 21-22.—American Association of Railroad Superintendents, St. Louis, Mo.
- May 26-29.—Master Boiler Makers' Association, Philadelphia, Pa.
- May 28.—Association of American Railway Accounting Officers, Atlantic City, N.J.
- June 10-12.—Master Car Builders' Association, Atlantic City, N.J.
- June 15-17.—American Railway Master Mechanics' Association, Atlantic City, N.J.
- June 16.—Train Despatchers' Association of America, Jacksonville, Fla.
- June 16-19.—American Society of Mechanical Engineers, St. Paul and Minneapolis, Minn.
- June 24.—Association of American Railway Accounting Officers, Minneapolis, Minn.
- June 30-July 4.—American Society for Testing Materials, Atlantic City, N.J.
- July 14-17.—International Railway General Foremen's Association, Chicago, Ill.
- July 20-22.—American Railway Tool Foremen's Association, Chicago, Ill.
- Aug. 18.—International Railroad Blacksmiths' Association, Lima, Ohio.
- Sept. 1-4.—American Boiler Manufacturers' Association, New York.
- Sept. 8-10.—Roadmasters and Maintenance of Way Association, Chicago, Ill.
- Sept. 8-11.—Master Car and Locomotive Painters' Association of the United States and Canada, Reading, Mass.
- Oct. 20-22.—American Railway Bridge and Building Association, Los Angeles, Cal.
- Nov. 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Detroit, Mich.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

- Canadian Car Service Bureau, J. Reilly (acting), 401 St. Nicholas Building, Montreal.
- Canadian Electric Railway Association, Acton Burrows, 70 Bond Street, Toronto.
- Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building, Montreal.
- Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.
- Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal, 2nd Tuesday each month, 8.30 p.m., except June, July and August.
- Canadian Society of Civil Engineers, C. H. McLeod, 176 Mansfield St., Montreal.
- Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.
- Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.
- Dominion Marine Association, Counsel, F. King, Kingston, Ont.
- Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.
- Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.
- Engineers' Club of Toronto, R. B. Wolstey, 94 King St. West, Toronto.
- Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.
- International Water Lines Passenger Association, M. R. Nelson, New York.
- Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.
- Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.
- Quebec Transportation Club, J. S. Blanchet, Quebec.
- Ship Masters' Association of Canada, Capt. E. Wells, 45 St. John St., Halifax, N.S.
- Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

R. R. Neild, General Superintendent, Manitoba Bridge & Iron Works, read a paper before the Western Canada Railway Club in Winnipeg, April 6, on the manufacture of iron and steel.