Railway Department

PROVINCE OF BRITISH COLUMBIA

ANNUAL REPORT

Year Ended December 31st

1954

VICTORIA, B.C.
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1955

To His Honour CLARENCE WALLACE, C.B.E.,

Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

I have the honour to present herewith the Annual Report of the operations and activities of the Railway Department for the year ended December 31st, 1954.

W. R. T. CHETWYND,

Minister of Railways.

Victoria, B.C., January 24th, 1955.

VICTORIA, B.C., December 31st, 1954.

The Honourable W. R. T. Chetwynd,
Minister of Railways, Victoria, B.C.

SIR,—I beg to submit herewith the Thirty-seventh Annual Report of the Railway Department, covering the year 1954, together with Appendices.

Your obedient servant,

J. S. BROADBENT,
Deputy Minister.

Report of the Railway Department

FOREWORD

The industrial expansion in British Columbia over the past few years has been phenomenal. Most of us are apt to think this great expansion is due alone to our vast and unlimited natural resources and the development of our natural water power. One should remember, however, that improved methods of transportation have been and will continue to be the deciding factor in our future development. Therefore, transportation and improvements in transportation facilities become increasingly important to our economic structure.

The huge Alcan project has been possible due to modern transportation—aerial tramways, helicopters, aeroplanes, trucks, and railways—and modern material-moving equipment has been the key which unlocked this vast storehouse of power and pointed the way to greater accomplishments, the threshold of which we are about to enter.

It is to be remembered that private enterprise provided most of the transportation of which we speak. Privately owned roads have been hacked out of a wilderness. Privately owned aeroplanes, helicopters, and aerial tramways have transported the workmen to otherwise inaccessible places. Privately owned trucks have transported the raw materials where public roads could never have been economically possible.

We have therefore continued to assist private enterprise in its change-over to new methods of transportation. In this respect our inspection and safety-engineering service has been extended to industry wherever requested. The companies making the requests for our services furnished transportation for our personnel at no appreciable cost to the Department.

The safety of workmen and prevention of accidents has therefore been taken care of, and it is felt that, apart from the safety aspect, private enterprise is being encouraged to expand and to provide and govern its own systems of privately owned transportation facilities necessary for industrial expansion.

The inspection services and field work as outlined in the following report have been accomplished by a staff of only four Inspectors, who have also been appointed as Inspecting Engineers pursuant to the provision of the "Railway Act," namely: R. E. Swanson, Chief Inspector; W. E. Tyler, Inspector; J. H. Carmichael, Inspector; and W. F. Thomas, Inspector.

V.L. & M. at Devil's Elbow, Copper Canyon. Engine No. 1044.

A HISTORY OF RAILROAD LOGGING

By Robert E. Swanson

The fabulous escapades of the legendary Paul Bunyan have no place in a factual report such as this, though it cannot be denied that many of the ingenious feats of those boisterous outdoor men upon whom we have bestowed the title of " logger " must have been inspired by the folk-lore of the Paul Bunyan tales.

Actually the first logging done on the Pacific Coast was accomplished by the Haida Indians on the Queen Charlotte Islands. Those hardy tribesmen, nurtured in the cruel climate of those northern isles known as the Queen Charlottes, atavistically inherited a cruelty which surpassed the rigours of the climate which, according to their own legends, spawned them.

Great war canoes were fashioned from huge cedar logs so they could conquer and plunder native tribes as far south as the Columbia River sand-bars. The best logs, naturally, grew 2 or more miles from the tide-water, and skid-roads were built so the canoes could be dragged out and floated to native villages such as Skedans, where they were fashioned and steamed into shape. I have walked over those ancient skid-roads and have seen abandoned canoes 40 feet long upon which 200-year-old hemlocks were growing, and was told by the old chiefs that slaves had been used to drag out the partly finished canoe logs by the use of ropes fashioned from hemlock-root fibres.

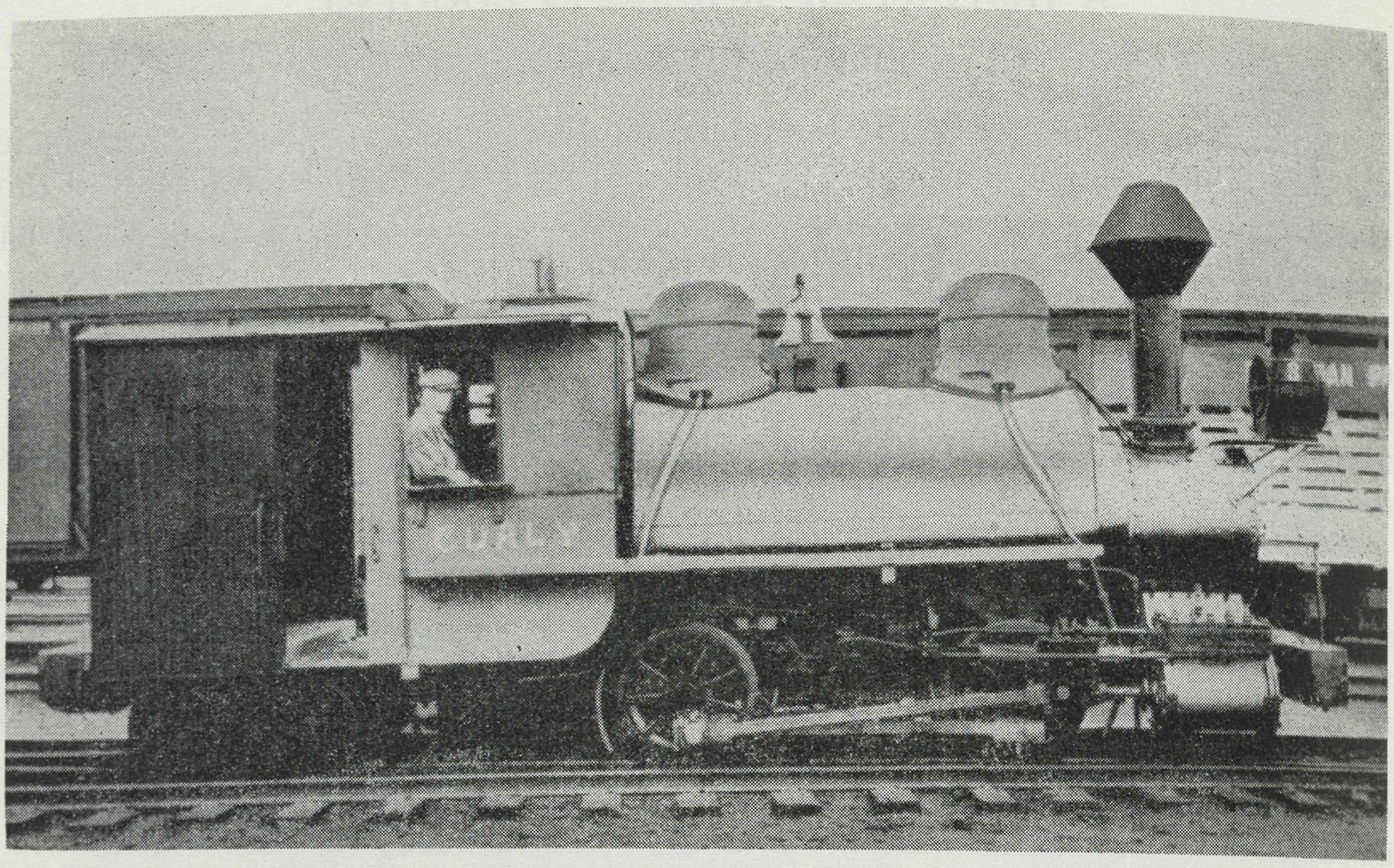
The first logging actually done by the white man was on the west coast of Vancouver Island when Captain Vancouver outfitted his ships with new Douglas-fir masts, the old ones having been broken by the wild sweeping storms of the then unexplored Pacific Ocean.

Of course, a certain amount of primitive logging was done by the Hudson's Bay Company in building Fort Camosun, now Victoria, but aside from this the first commercial logging for sawmills started in about 1850, when coal-mining began at Fort Rupert and Nanaimo. In those days the motive power was supplied by plodding oxen dragging the logs over corduroy roads. About 1898, oxen were to some extent replaced by horses, until some Paul Bunyan-inspired logger rigged up the first steam-donkey which, with the use of mile-long cables, dragged the logs along skid-roads to the sawmills with horses dragging the cables back for the next trip.

The advent of steam in the woods opened up a new era in the annals of logging transportation, for now by burning wood the intricate and locked-up power of steam could be used to advantage in the place of the muscular power formerly supplied by horses and oxen.

There is some controversy as to where the first steam-locomotive was used in the woods. Some authorities claim it was used by the Hastings Mill in logging around Thurlow Inlet and Quadra Island, while others swear the first actual logging-locomotive in British Columbia was used in the neighbourhood of Chemainus. Despite the controversy regarding the first use of locomotives, the fact remains that in 1900 Chemainus used a little 45-ton Climax locomotive to drag logs down the skid-road from Miller Creek. Formerly horses had been used, then road donkeys powered by steam, but finally the timber got farther and farther back and roading donkeys were no longer practical. Again a genius came to the rescue and decided, " Why not spike railway steel on the skid-road and have a Climax locomotive drag the logs between the rails? " This was done, and records prove this type of logging continued for a number of years. On some occasions, especially on frosty mornings, the logs pushed the locomotive down the grades and it was necessary to sand the skid-roads; on the other hand, in dry weather it was necessary to grease the skids so the Climax could haul more logs.

When skidder logging was adopted from Louisiana and huge steam-machines were brought into the woods, the old locomotive skid-road system fell into disuse and proper



When " Curly " was No. 3, pride of the Canadian Pacific Railway in 1887.

Locomotive " Curly," first logging-locomotive, 1894, at Nikomekl River, British Columbia. Engine worked on Panama Canal and in 1887 worked on C.P.R. construction. Now in Hastings Park, Vancouver.

railroad was laid. This took place between 1904 and 1910. However, proper logging-cars had not yet been developed, nor were air-brakes used in the woods. During this era Victoria Lumber Company at Chemainus imported a rod engine from the Pennsylvania Railroad known as "No. 21," and Charlie Cathie ran this engine, fired with shingle hay from the sawmill. Instead of "cars," trucks were used, which were merely sets of railroad wheels with bunks attached, and the logs were loaded and strung out along the railway. Brakemen rode the logs and applied hand-brakes whenever the locomotive engineer whistled for them. Many brakemen lost arms, feet, legs, and many never lived to tell the tale.

One is led to believe from a bronze plaque on a little locomotive called "Curly," now standing as a relic in Hastings Park, Vancouver, B.C., that this was the first logging-locomotive. The bronze tablet informs posterity that this locomotive was originally used on the building of the Panama Canal and was brought to British Columbia to complete the Canadian Pacific Railway construction, that it fell into disuse and was bought by the Hastings Company, better known as B.C. Mills and Trading Company, where it was employed as a logging-locomotive, and old-time loggers tell us that a camp foreman by the name of Saul Reamy used the locomotive to haul logs on Thurlow Island and Quadra Island in 1901, and later that the locomotive went to Rock Bay.

Speaking of Rock Bay, it might be mentioned that when Hastings Company finished up there and the claim was abandoned, Merrill, Ring & Wilson moved in with a large railroad show which employed two 90-ton Pacific Coast Shay locomotives and several Climax locomotives. This claim finally wound up in 1941 as a railroad show, and the No. 5 Pacific Coast Shay locomotive went to Cowichan Lake and the No. 4 went to Kelsey Bay. No. 4 locomotive is now on the Queen Charlotte Islands and No. 5 is now operating at Englewood.

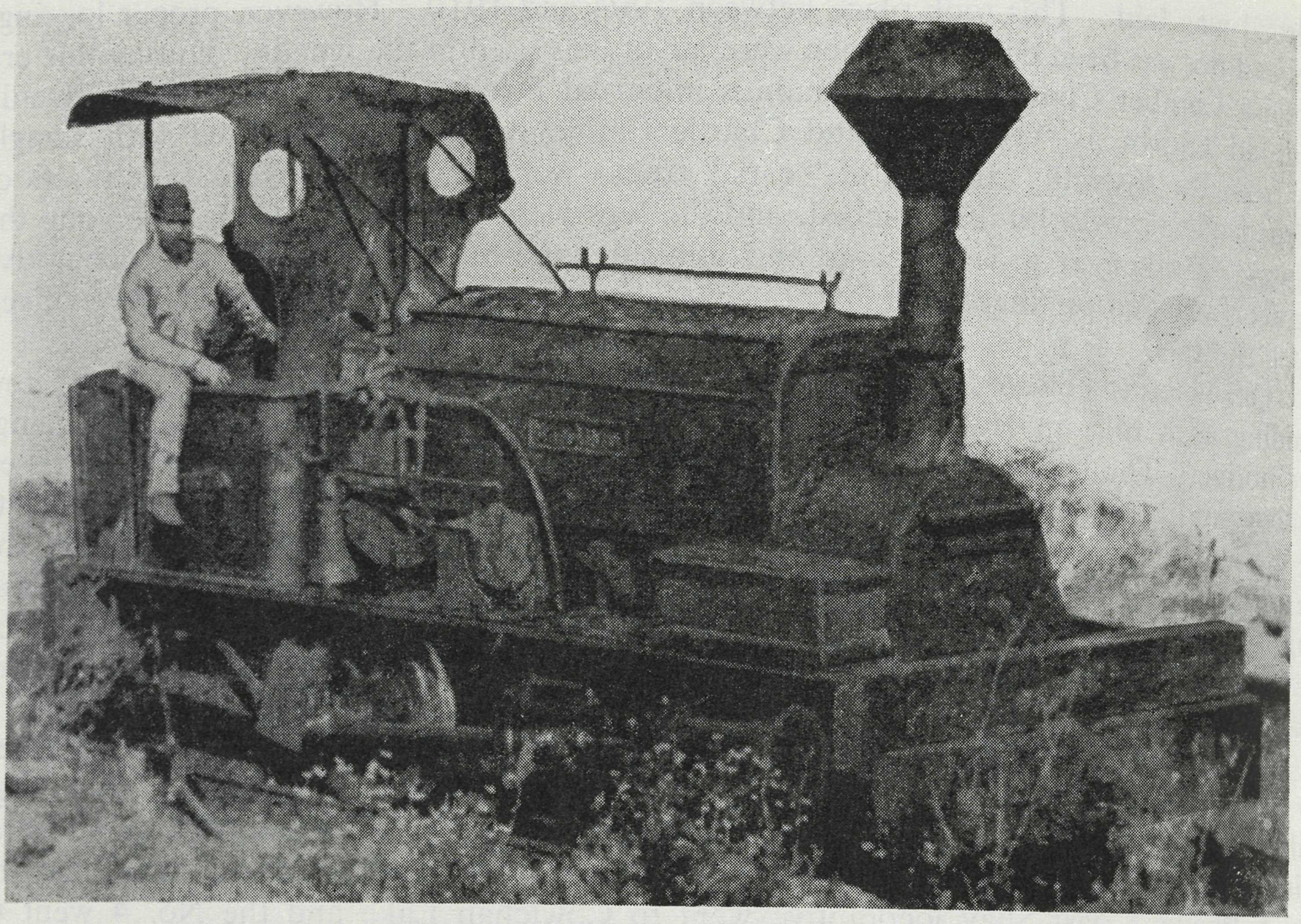
Regarding the controversy as to the first locomotive, it should be remembered that big things have small beginnings. In this respect, mechanically minded loggers obtained steam traction-engines as used on farms and had them fitted with bell-shaped wheels. A wagon-train was hooked on to the tractor, the cars also having bell wheels, and, instead of a regular railroad, round poles were spiked end to end on existing skid-roads to the exact gauge of the bell-shaped wheels on the steam traction-engines. These bell-wheeled "locomotives" hauled logs on Vancouver Island as early as 1900 and as late as 1930. One of these original traction-engines, known as a Waterloo, now stands in Jerry Wellburn's museum at Deerholme, near Duncan, B.C. It is in quite good shape, and it is hoped that one day Mr. Wellburn will steam it up for a demonstration.

From this it is evident that the heavy grades encountered during the early days of railroad logging demanded a locomotive of a different breed than the conventional type. Geared locomotives were ultimately developed, known as Shay, Climax, and Heisler locomotives. The Heisler was a half-breed between a geared locomotive and a conventional rod engine, as it had both gears and side-rods. The rod engines were also especially adapted for logging by using saddle tanks, placing nearly all weight on drivers and incorporating very small wheels.

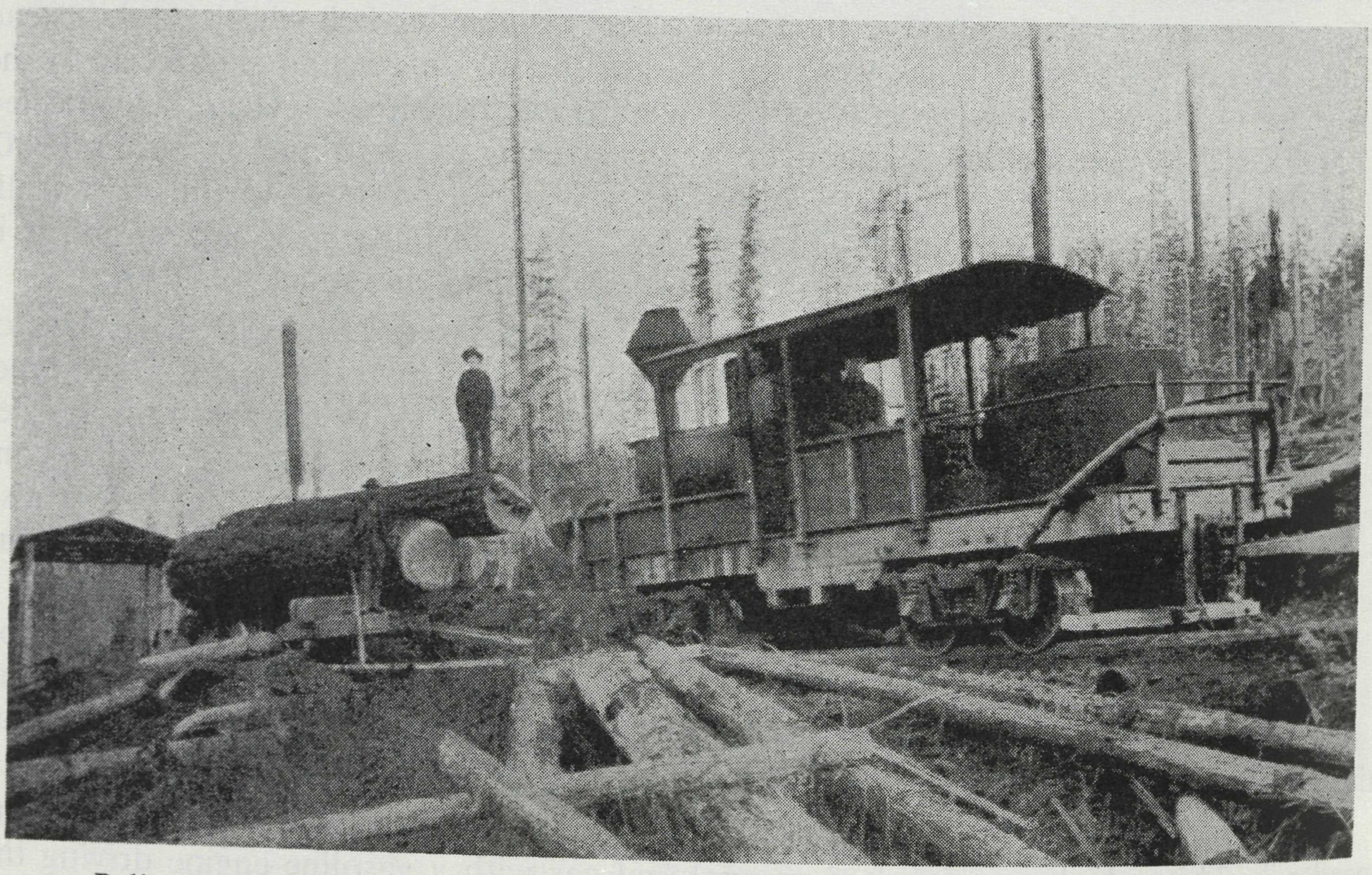
By 1918 so many accidents had occurred in the woods due to lack of brakes on heavy grades that the Department of Railways was forced to take action. Rules were passed requiring all logging-trains to be equipped with air-brakes. By 1925 this was ultimately accomplished.

Another innovation developed in the logging railroad industry was called the "speeder." This vehicle consisted of an enclosed car with a gasoline-engine driving the wheels through a chain-drive. Speeders were used principally for the transportation of crews and were ultimately required to be equipped with air-brakes.

At Jordan River, near Victoria, the Island Logging Company employed locomotives to haul logs to the beach. When the claim was taken over from the Michigan Lumber



Locomotive " Nanaimo " came around the Horn from England in 1874, worked on Pacific Great Eastern Railway in 1912, and scrapped in 1923. Engineer Hickman in cab, in 1895, at Nanaimo. This engine was No. 1 on the P.G.E. when that railway was first known as the Howe Sound and Northern.



Bell-wheeled Climax, Shawnigan Lake, 1903. Engine called " Betsy " and ran on a wooden-pole road.

Company in 1912, a 50-ton Climax was inherited which was later sent to Rock Bay. This old locie was scrapped at Franklin River in 1947.

Skidder logging was the vogue in 1911 when the Comox Logging and Railway Company came into existence, making use of both skidder logging and locomotives. Some of the original locomotives which operated near Courtenay are still operating. In particular the No. 7, a little saddle-tank engine which came from the Pacific Great Eastern Railway, is still operating on the main line at Ladysmith. The geared Heisler locomotives used until recently by the Comox Logging Company came from the Columbia River Logging Company at Golden, B.C.

Most old-time loggers will remember Bloedel, Stewart & Welch's big logging camp at Myrtle Point near Powell River. This camp started operations also in 1911 and the superintendent's name was Reilly, who must have been Paul Bunyan-inspired, as he invented the steam duplex system of loading and used railways to a larger extent than ever before used in the woods. Bloedel's first locomotive was known as "No. 1." It was a small 45-ton Shay which burned wood and had a balloon stack, and when the claim at Myrtle Point wound up in 1928, the locomotive went over to Menzies Bay and from there to Great Central Lake; when Central Lake shut down a few years ago the "One Spot" was loaded and shipped to Vancouver to be sent on to the Philippine Islands, where it was to continue its long and useful life. However, something went wrong with the export deal and it was refused an import permit. It was then that Jerry Wellburn bought the locomotive, had it transported over the Canadian National Railway to his farm near Deerholme, B.C., where it can be seen to-day standing as a monument to the early loggers with its balloon stack, its head-light and whistle painted yellow—all dolled up in his back-yard museum.

Another logging-locomotive of interest was the "Six Spot" at Chemainus. This was a 50-ton Shay carrying 180 pounds of steam, built by the Lima Locomotive Works in 1906. This engine was operated by Len Cary, who died a few years ago. After his death the locomotive was scrapped.

Then there was the big rod engine known as the "One Spot" on Cathels & Sorenson's railroad at Port Renfrew. It was whispered around the West Coast that this locomotive was too big to stay on the track, and so it remained in an old locomotive-shed for many years until purchased by Victoria Lumber Company. It is now operating on the railway between Ladysmith and the Nanaimo River and is known as the "Ten-O-Seven." It was built by the Montreal Locomotive Works in 1923.

Then there was the New Ladysmith Lumber Company Railway, which was first built near Cassidy serving a small sawmill in Cedar District. The locomotive used was a little pot known as "The Nanaimo." It weighed about 10 tons and was brought around the Horn in a sailing-ship from England in 1874. It had only two drivers. It was resurrected from the scrap heap in 1912, and its history continued when it was shipped to Squamish to lay steel on the Pacific Great Eastern Railway, and it worked on the P.G.E. until about 1915, operated by a hogger called Angus McRay. Then it disappeared and a rumour floated around the country that the little engine was abandoned somewhere in the woods, but no one knew where. It was wanted for a monument in Nanaimo. Harry Nichols, road foreman of engines, who had run the locomotive on the P.G.E. when he was a kid, loaded it out as scrap in 1923, thus ending its long and useful career. This little pot had a copper fire-box and little side-tanks, and the engineer usually ran it with one leg hanging out of the window.

Charlie Snowden, of Nanaimo fame, had operated the little "Nanaimo" when it first came to Nanaimo; but to continue with the New Ladysmith Lumber Company Railway, Charlie Snowden also operated the streak of rust from Nanaimo to East Wellington in 1908. The locomotive used on that railway was of real interest as it was originally No. 168 of the New York Elevated Railways. It had a vacuum bellows to apply the

Charlie Snowden's locomotive, Nanaimo, 1925.

brakes on the wheels. In 1914 it fell into disuse when it was replaced by a 27-ton saddle-tank engine built by the Canadian Locomotive Works in Kingston, Ont. This 27-ton monster worked on the New Ladysmith Lumber Company line until the road was abandoned in 1933. This road not only served the mill at East Wellington, but hauled coal from the Jingle Pot mine and bricks from the several brickyards located along the right-of-way, and, as a matter of historical interest, was constructed on the old right-of-way of the original railway that ran from Departure Bay to East Wellington. The locomotive that ran on the original coal-road is now standing in Piper Park, Nanaimo, B.C., is narrow gauge, and is known as the "Wellington." It was built in 1883 by the Baldwin Locomotive Works.

Another railway of interest was the narrow-gauge railway of the Eastern Lumber Company near Ladysmith, which was a reconstruction of the original narrow-gauge railway that ran from Crofton to Mount Sicker mines, near Duncan. The little Shay locomotive was brought up to Ladysmith and operated as a logging-locomotive until one day, due to the narrow gauge, it turned over and killed the engineer, and the Department of Railways thereafter condemned the use of narrow-gauge locomotives for logging and specified that all logging-railroads should be standard gauge.

The Rat Portage Lumber Company purchased a large Climax locomotive from the Climax Locomotive Company in 1918. Shining, brand new, it was put to work at the head of Indian Arm near Vancouver, and the first day it ran away, with the train hitting a stump and the locomotive diving into the salt water with only the stack sticking out. It was resurrected and put back on the track, and it worked for many years around Vancouver, later went up to Vedder Crossing near Chilliwack, and from there to Englewood, where it is still operating and hauling logs every day. The man running this locomotive to-day is known as Curly Hutton, the last original locie puncher in the woods.

After fifty years of railroad logging, the timber finally got to be so far back in the hills it was impractical any longer to build railroads to the tops of the mountains. Again a Paul Bunyan-inspired genius came to the rescue and decided that logging-trucks could do the job. Well, logging-trucks did the job as they were better on steep grades to feed main-line railroads transporting logs to the salt water. Some operations are now 60 miles back from the salt water. And while to-day several operations, such as Englewood, consider it cheaper to operate a railroad show, most of the loggers consider logging-trucks are the answer to the actual logging operation, with railroad best adapted for long transportation of logs.

Thus to-day some of the camps are part truck and part railroad, while others are all truck. At Franklin River a large articulated Mallét steam locomotive is used to wheel the logs from the back end of the claim to the beach, and the railroad is fed by logging-trucks. Some of the logging-trucks weigh as much as 70 to 80 tons when fully loaded. They are equipped with very complicated air-brake systems, and the drivers have to be carefully trained to operate on the heavy grades encountered.

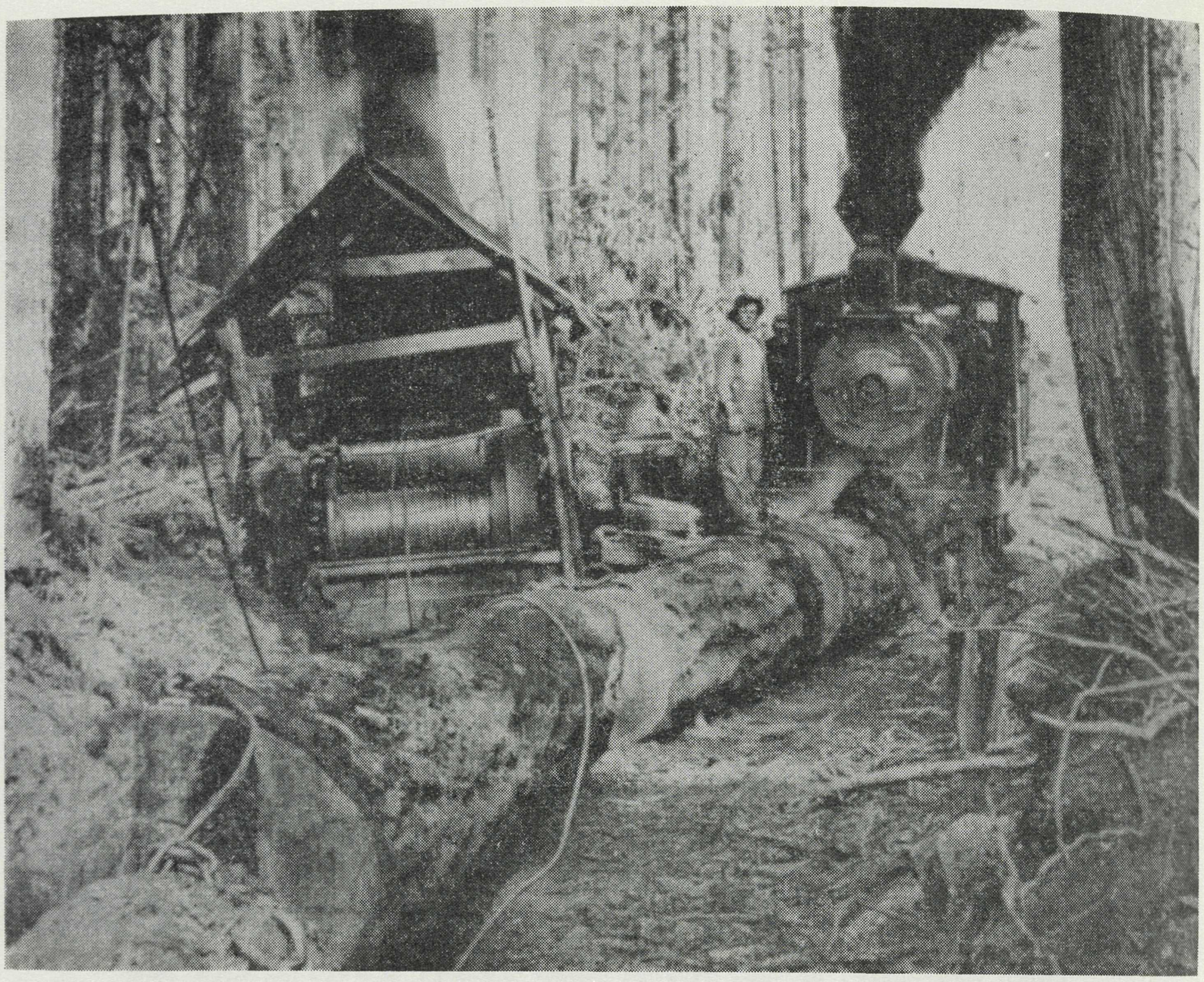
And so while progress goes ever forward, the spirit of the legendary Paul Bunyan continues to inspire the logger to accomplish bigger and better things yet to come. Who knows? Some day logs might be hauled with helicopters!

Bull teams in 1891 at Thurlow Island (twelve yoke or twenty-four oxen).

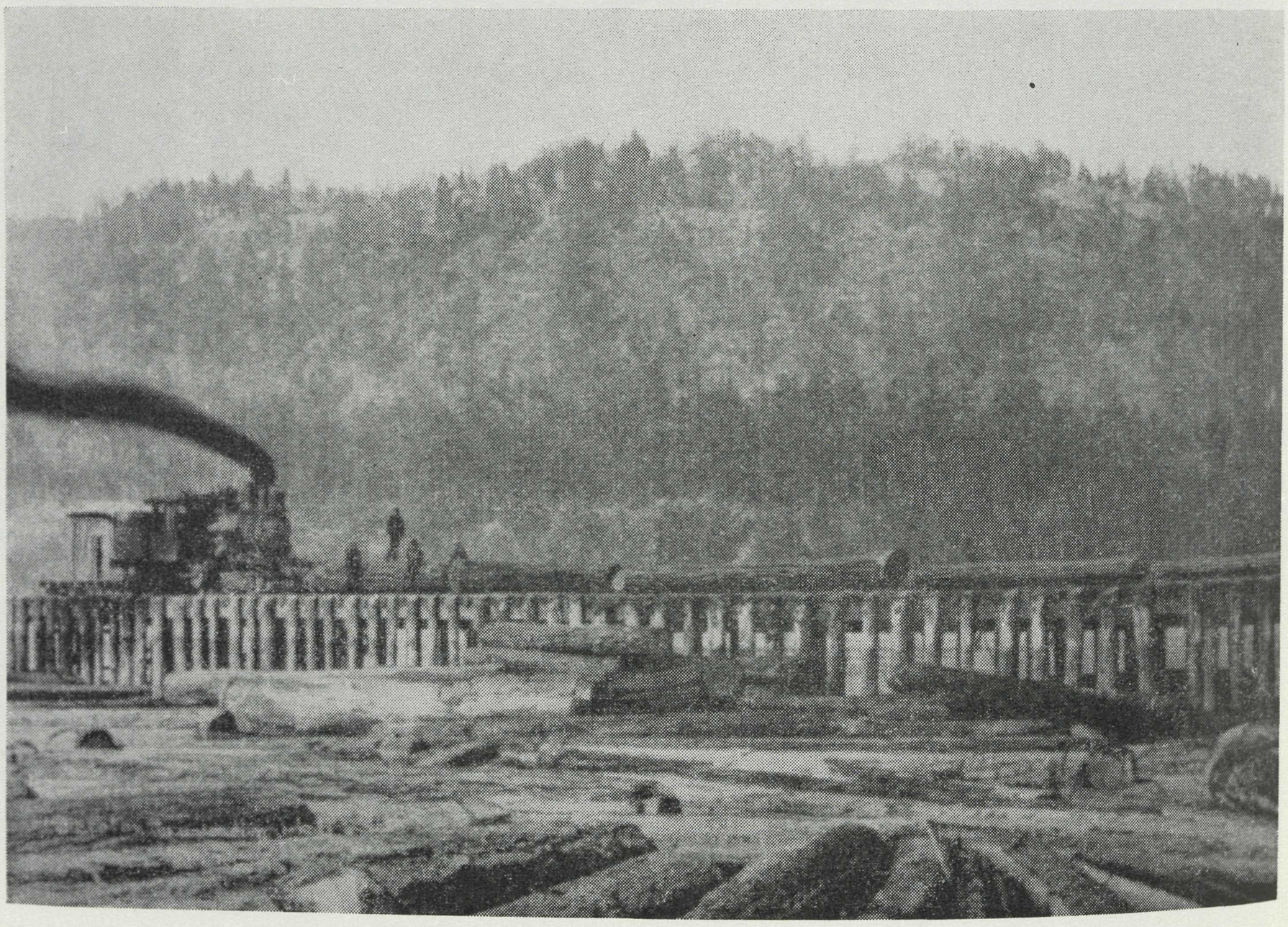
Horse teams on a skid-road in 1900 (ten horse-power).

Rigging crew, 1902, with line-horse.

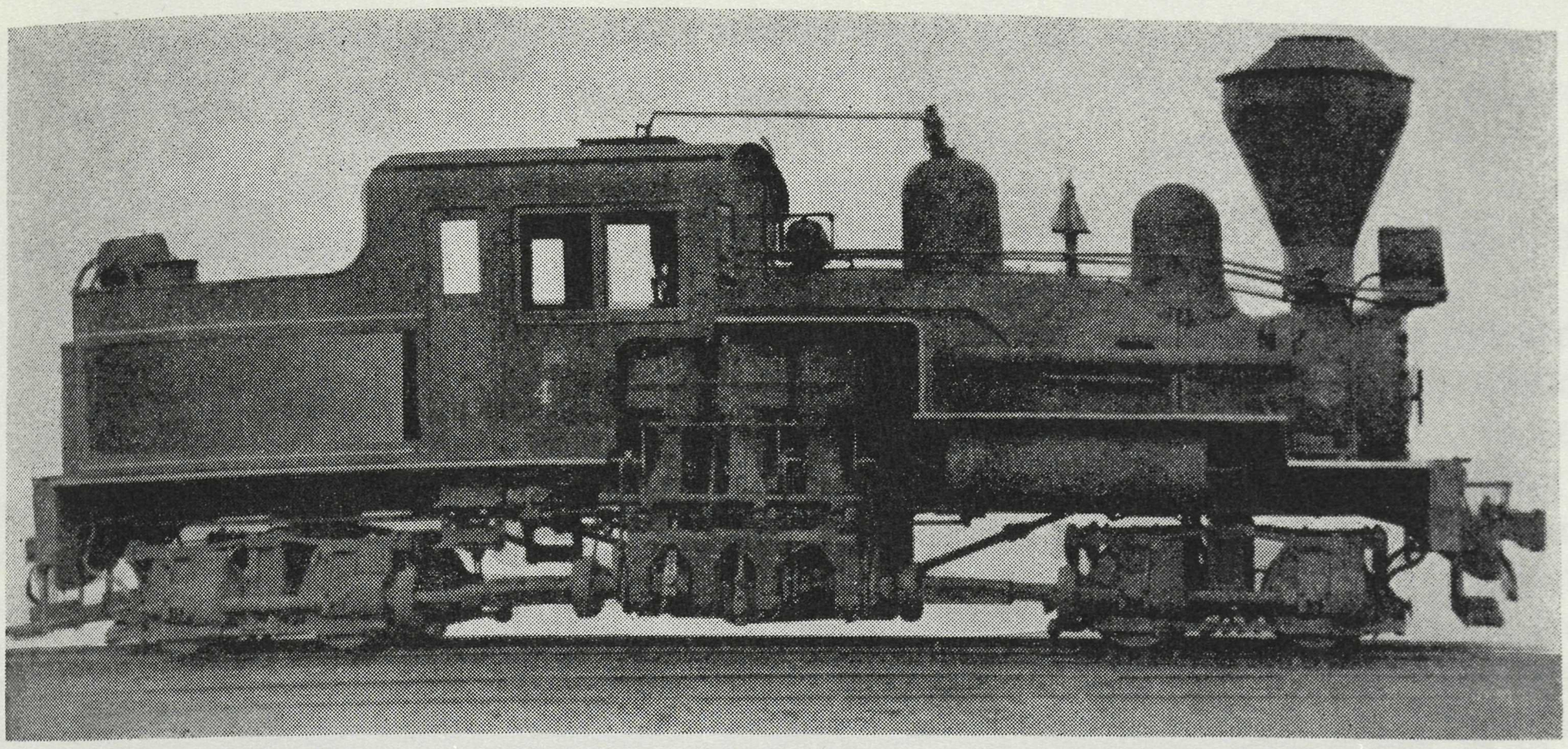
First steam spool donkey, about 1900, Vancouver Island.



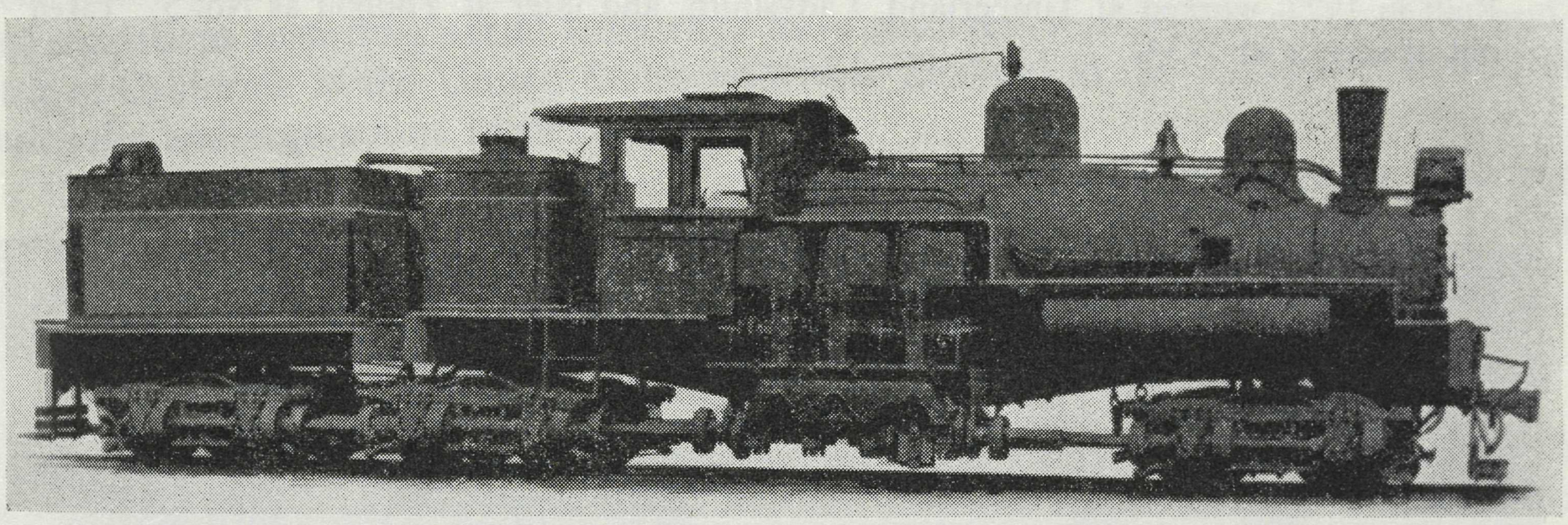
A 45-ton Climax taking a " turn " from 10x12 road donkey in 1901 when logs were dragged between the rails.



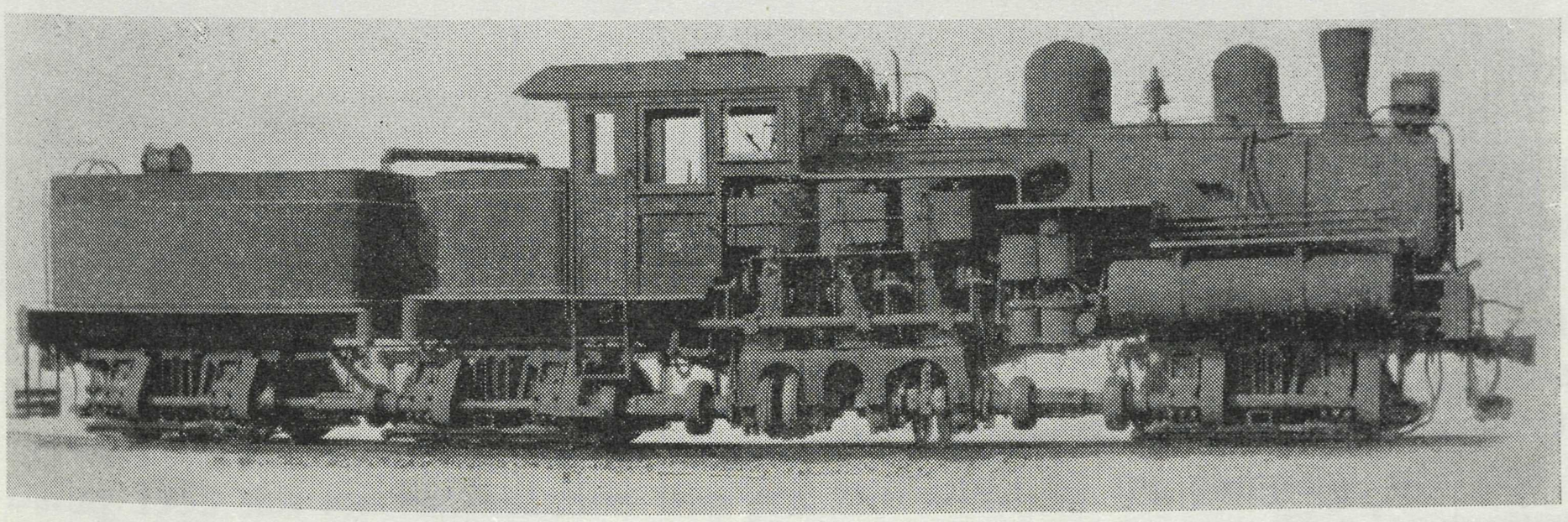
" Three Spot," Chemainus, dumping at beach after dragging the " turn " between the rails from Miller Creek.



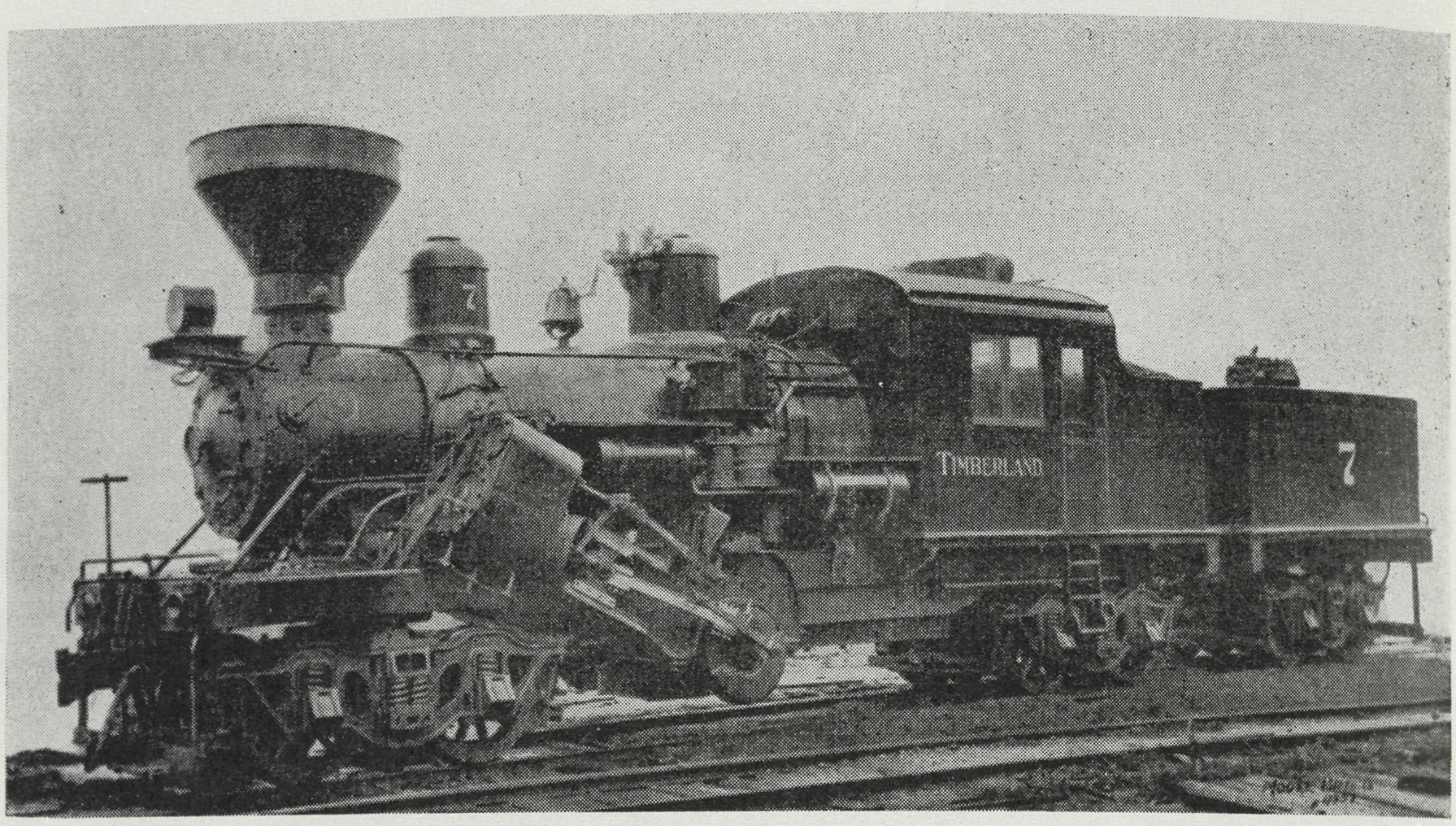
A 50-ton Shay—superheat wood-burner, a popular size from 1920 to 1930.



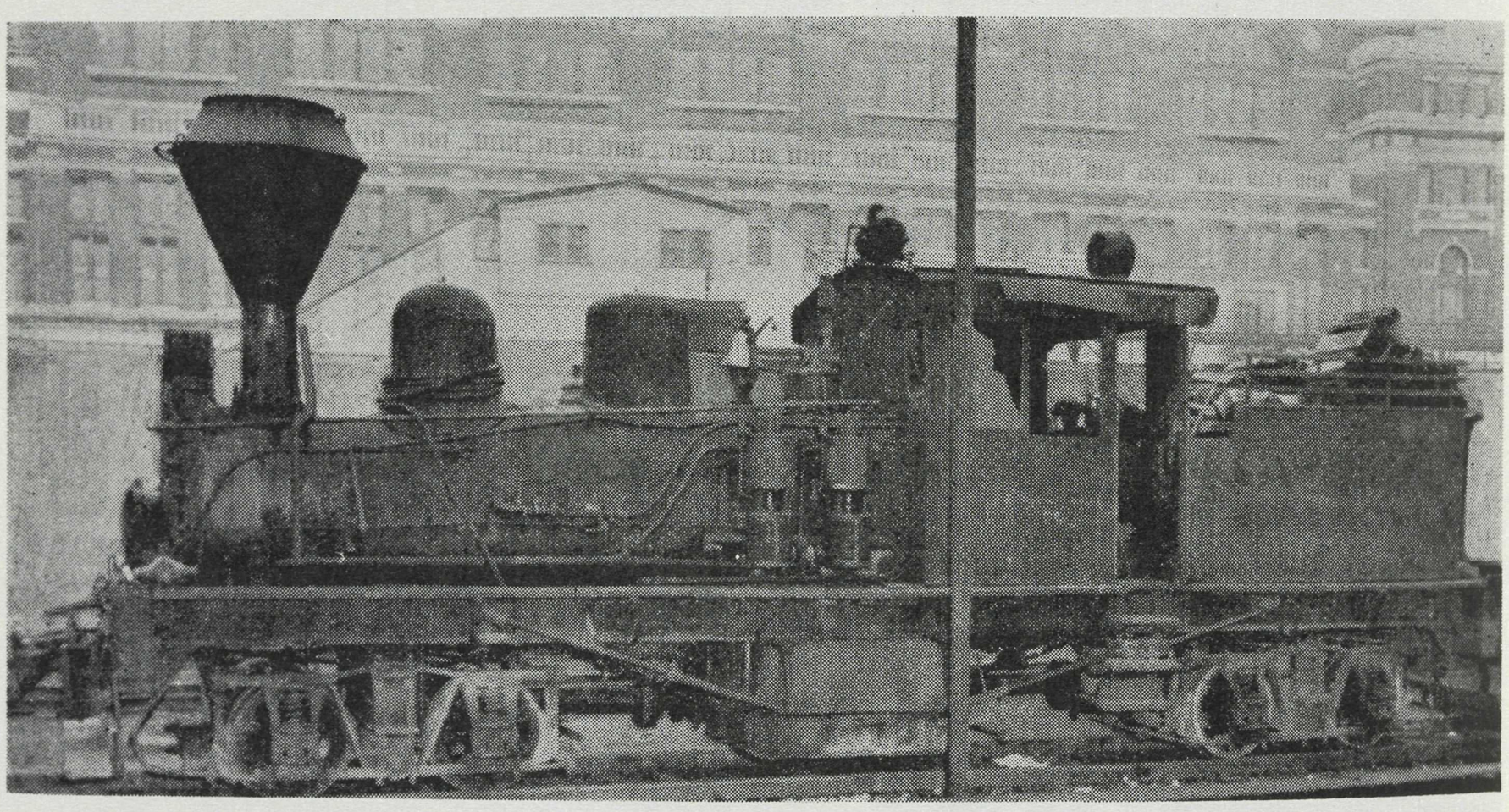
A 70-ton Shay (wet steam) at old "IT," Campbell River. Engine ran up until 1953.



A 110-ton (Class 90) Shay, three trucks. There were only five of these in British Columbia between 1925 and 1950, with one left in 1955.



The biggest Climax ever built was 115 tons and it had 44,000 pounds tractive effort. Built in 1927, worked at Timberland, Ladysmith, and later at Youbou as No. 5. Taken out of service in 1954.



Bloedel, Stewart & Welch's old " No. 1," wood-burning Shay, 45 tons, waiting to be shipped to the Philippines. In Vancouver, with C.P.R. station in the background. Now in Wellburn's museum, Deerholme, B.C.

REPORT OF THE RAILWAY DEPARTMENT

The continued industrial expansion within the Province intensified the activities of the Department, with many new transportation installations pursuant to the "Railway Act."

The staff of the Department, as of December 31st, 1954, consisted of a Deputy Minister, Chief Inspector, three Inspectors, one draughtsman, secretarial stenographer (Grade 2), and a senior clerk-stenographer.

The railways supervised by the Department include common carriers, industrial railways, and equipment used in conjunction with industrial operations of transportation.

The head office continued in charge of the records of the Department, and in conjunction with the Bureau of Economics and Statistics reports were prepared relating to extensions of the Pacific Great Eastern Railway to develop the untouched natural resources of North-east British Columbia. The Construction Department of the Pacific Great Eastern Railway Company in connection with the extensions of railroad from Squamish to Vancouver and Prince George north has been established within the Department at Victoria under control of the Deputy Minister. The Inspecting Engineers continued the inspection of the road-bed, track facilities, shops, mechanical facilities, and equipment of all the railways and other means of transportation.

With the increased use of the aerial tramway within the Province, further work was done with regard to the safety and operating of this means of transportation. Our rules and regulations regarding aerial tramways have received world-wide recognition and the State of California in the United States and New Zealand in the Antipodes have drafted their rules and regulations from ours.

In the field of diesel locomotives, studies and recommendations made with regard to axle loadings on light rail have been adopted by many of the railways in the Province.

INSPECTION OF PACIFIC GREAT EASTERN RAILWAY TRACK, STRUCTURES, AND MECHANICAL FACILITIES

On October 12th, 13th, and 14th an inspection was made of the railway from Squamish to Prince George by the Department of Inspecting Engineers. This inspection was carried out by V-8 track motor and conditions found are as follows:—

Generally, the track, road-bed, and right-of-way, together with bridges and structures, are in a very much improved condition over former years. The work and replacements which had been recommended on previous inspections have been put into effect by the company, and all officials concerned are co-operating most fully. Traffic is much increased and trains are running on better schedules and hauling much heavier tonnages than heretofore was possible.

In previous Annual Reports recommendations had been made that the new diesel power, as procured, should have 4-wheel trucks rather than the 6-wheel trucks which were currently being ordered. In making this recommendation, full consideration had been given to the light rail existing on the Pacific Great Eastern, and it was reasoned that it would be better in the long run to order locomotives with heavier power-axle-loading and work toward heavier rail as the existing rail was getting worn out and was very old. During 1953 this recommendation was put into effect by the company, and one locomotive was ordered with the standard 4-wheel truck arrangement. This locomotive was capable of hauling 25 to 30 per cent greater tonnage with the same horse-power. A work study showed it was no harder on track than the existing 6-wheel locomotives, and the company consequently ordered additional locomotives to the new specification. The new locomotives work out so well the company is now converting all its existing 1,600-horse-power locomotives to the 4-wheel truck arrangement, and consequently the increased traffic is being handled with longer trains and increased operating efficiency. The inspec-

tion reveals from observation, corroborated by the company's chief engineer, that the new locomotives are not hard on track.

When recommendations of the foregoing paragraph were made, recommendations were also put forward that, due to the age and worn condition of the rails on the Pacific Great Eastern Railway, a programme should be instituted so that 50 miles per year of 85-pound rail would be laid to replace the worn 60-pound rail. This would not only increase safety, but would enable schedules to be speeded up to take care of increased traffic; consequently, the following rail replacements have been put into effect:—

			Miles	Year
85-pound rail (new)—				
Mile 12.9	to Mile	29.4	16.0	1951
Mile 29.4	to Mile	35.6	6.2	1952
Mile 35.6	to Mile	40.3	4.7	1954
Mile 40.3	to Mile	53.0	9.7	1954
Mile 122.8	to Mile	154.3	31.5	1954
Mile 349.0	to Mile	429.0	80.0	1952[1]
70-pound relay—				
Mile 8.5	to Mile	12.9	4.4	1953

[1] Prince George Extension.

The rail programme should be continued in effect and at least 50 miles should be laid during 1955 as rail in many locations is badly worn at curves. It is imperative that the rail be changed in the vicinity of Anderson and Seaton Lakes. In these locations, rail is badly worn and bad derailments at these points have usually meant fatalities to operating personnel; therefore, new rail in these particular locations cannot be too strongly recommended.

An excellent job of ballasting has been done by contract during 1954, and in particular the following ballasting has been completed which meets with railroad engineering standards:—

			Miles	Year
Complete ballasting—				
Mile 201	to Mile	206	5	1953
Mile 182	to Mile	201	19	1954
Mile 349	to Mile	369	20	1954

The importance of ballasting should not be underestimated, and it is recommended that ballasting continue under a programme for several years until the track is brought up to proper standards. It must also be pointed out that, after construction in 1921 and years previous to that, the track had never been given a proper ballast lift as it was considered in those days traffic did not warrant the expenditure; however, traffic conditions are such to-day that ballasting should be given the same priority as rail replacement.

Bridges were inspected. Decking and ties as required have been renewed by the company and in some places bridges have been replaced by fills. The following bridges have been renewed:—

Work Done	Mileage	Year
Renewed	148.0	1954
Renewed	148.4	1954
Refilled, replaced by fill	321.4	1954
Replaced by fill	38.0	1954
To replace by fill	170.2	1954

At Deep Creek Bridge, Mile 292.6, where concrete pedestals were spalling, four pedestals are being reconstructed. This work was under construction at the time of inspection. On the Quesnel River Bridge, Mile 346.5, eight bents on the north approach were renewed. New 85-pound rail has been laid on the Fraser River Bridge, Mile 123.0.

The Cottonwood Bridge was examined. There is no evidence of any settlement of the piers. The gravel laid for the run-off is not sloughing, and it was found that approximately 3 to 5 gallons of water per hour was running out of the drainage-tunnel.

Kale Creek Bridge on the Prince George extension has given considerable trouble due to the fill sloughing out. It was therefore necessary to redrive six bents with piling on the north embankment, which work was completed by the end of 1954. The approach on the north embankment appears to have stabilized after several thousand yards of gravel had been dumped in the fill.

Approximately 15 miles of ditching has been completed during 1954. In several locations, close cuts have been widened by the use of the company equipment, and considerable rock scaling has been completed between Mile 15 and Mile 30.

The following sidings and spurs have been installed or completed during 1954: Industrial sidings, six; industrial spurs, two to complete (under construction); 50-car siding completed at Mile 182; 50-car extension on siding under construction at Mile 307.4; Garibaldi siding, Mile 22.2; Canim siding, Mile 215.3 (to be extended during 1954); and on the Moran and Pavilion sidings, rail has been changed from 60-pound to 70-pound.

A new apron was constructed and installed on the barge-slip at Squamish during the fall of 1953. During 1954 forty piles were required in the dolphins at the Squamish barge-slip.

Three new 1,600-horsepower diesel-electric locomotives were on order for delivery by the end of 1954, and one locomotive has been delivered. The two remaining locomotives are expected by February 1st, 1955. These diesels will have the standard 4-wheel truck arrangement. When the new diesels are in operation, it is expected that all steam power can be abandoned. With this in mind, a programme of not maintaining water-tanks is being inaugurated. The water-tank at Quesnel has therefore been dismantled.

Shop facilities have been improved at various points on the line; however, with increased traffic and additional motive power and rolling-stock, a new diesel repair-shop is badly needed at Squamish. The 1953 report recommended a drop-pit, wheel-lathe, and wheel-press. These items are also badly needed and should be included in the new shop appropriations.

In conjunction with truck and facility inspections, a study was made of level crossings. The level crossing at Quesnel presents a dangerous condition to the public. The highway has priority over the railway due to its existence prior to the railway, but it should be pointed out that several junction roads adjacent to the crossing have come into existence in recent years. In view of this, it would appear that a joint effort should be made by the Department of Public Works and the Pacific Great Eastern Railway to install a regulation automatic flasher at this crossing, the circuit of which, due to switching operations, can be formulated for satisfactory protection.

Yards and facilities at Prince George have continued to improve during 1954. The construction of the south link, Squamish to Vancouver, is progressing, several inspections having been made by Department Inspecting Engineers, with a study inaugurated regarding the elimination of a number of level crossings in West Vancouver.

Conclusion

It can be reported the Pacific Great Eastern Railway is in a very much improved condition over previous years. Appropriations for improvements and replacements have been used to good advantage, so that the railway is now in safer condition than it has ever been; however, the programme of rail replacements, ballasting, and betterments must be continued under definite replacement programmes already instituted by the Maintenance-of-way Department. Mechanical shop facilities at Squamish, Lillooet, Williams Lake, and Prince George are much improved over previous years. Washrooms, boiler-

plant improvements, and sanding facilities and shop storage-track space are required at Lillooet and Williams Lake, and a new diesel maintenance-shop is required at Squamish.

The rail wear is quite serious on curves of 12 degrees and over. New rail will soon require to be turned in several locations. Locomotive-wheel flanges are cutting badly, and while track-oilers are to be installed at some points, flange-oilers on all 1,600-horse-power locomotives are required. Flange-oilers on the locomotives will not only cut down on rail wear, but it is expected the life of the wheels could be quite easily doubled.

The foregoing matters should be taken into consideration when making the 1955 appropriations.

GENERAL INSPECTION OF RAILWAYS AND OTHER TRANSPORT

General Trends.—Transportation facilities in British Columbia during 1954 kept pace with the current industrial development. This condition applies to public and common-carrier transportation as well as industrial and privately owned transportation systems. In spite of current press statements that rail haulage has decreased on a national basis, rail haulage within the Province has increased.

Passenger traffic as well as freight movement increased 27 per cent over 1953 on the Pacific Great Eastern Railway, and on the British Columbia Electric Railway freight movements from Huntingdon to New Westminster increased to the point where the company has ordered additional diesel-electric motive power. In the industrial field of railroading the trend continues from railway to truck haulage. Several of the larger companies have abandoned railway and reconstructed the existing right-of-ways into truck-roads. This condition also applies in a lesser degree to the mining industry; specifically Canadian Collieries (Dunsmuir) Limited, upon abandoning its No. 8 mine at Cumberland, also abandoned its main-line railway, retaining only the marshaling yards at Union Bay. It now feeds the remainder of the railway operation by trucks operating over privately owned roads from the Tsable River mine near Fanny Bay, a distance of 8 miles.

On the other hand, the railways, in conjunction with mining at Fernie, Kimberly, and Trail in Eastern British Columbia, have in no way diminished in proportion or function. Notwithstanding this, however, the trend is away from the time-honoured methods of logging to other more advantageous methods, except where long-haul transportation is involved. This is due to the impracticability of short railways in the higher, rougher country now being exploited. In other industries large and complicated aerial tramways are under construction, as covered later in this report.

Logging-trucks vs. Railways.—As already stated, several of the logging companies have changed from logging-railways to motor-trucks operating on privately owned roads. In most cases when rails were removed, the right-of-way was reconstructed into a truck-road. This trend is due not to the failure of railways or increased cost of railway operation, but is due to all accessible timber now being on high ground where railway is impracticable. Notwithstanding the modern trend to trucks, it is reported that at Franklin River 21 miles of logging-railway was constructed in 1953, and several operations report they will keep existing railways where they supply a means of cheap log transportation.

Logging-railways.—All logging-railways were inspected in 1954. In some cases, bridges required renewal and repairs. Log-dumps required our new safety device to be installed. All boilers were inspected and certificates issued. At Englewood, where a 50-mile railway is in operation, both logging-trucks and railway operation were inspected. Crews were examined and certificates issued on both rail and truck operation. Where rail operations have been replaced by logging-trucks, the best of the rolling-stock has been transferred to other companies operating railway. In many cases, locomotives, cranes, and heavy equipment have been transferred. Department Inspectors have inspected the equipment and in most cases advised the companies as to the general history and life expectancy of the materials concerned.

Diesel-Electric Study.—The use of diesel motive power on logging-railways is now well established, as proved by tests in 1951 when General Motors loaned a diesel locomotive to various logging-roads to prove they were superior to steam. The 1951 tests were under the direction of Department Inspectors and reports were compiled. Continuing since the tests through 1954, the companies have relied on the Department's advice regarding the use of diesel power, so that at least two of the remaining logging-railways are at present negotiating for the procurement of diesel locomotives. In this regard it is of interest to note that Pacific Great Eastern Railway now hauls several log-trains per day by diesel locomotives, and this condition also applies to the Esquimalt and Nanaimo Railway on Vancouver Island. In both cases, Department Inspectors checked the condition of the log-cars used, as the safety of workmen during loading operations was involved.

Mining-railways.—On the mining-railways regular inspections were made of all equipment and track. The Morrissey, Fernie and Michel Railway, at Fernie, where a large diesel-electric locomotive is used, has continued to operate to full capacity. The narrow-gauge steam-locomotives at Elk River Colliery and at Michel were inspected, and operators, where necessary, examined and certified. At Kimberly the rail-haulage system has been inspected. A fatal accident occurred at this operation when a workman got involved in the dumper. Safety precautions were recommended. At Trail, accidents occurred which were investigated, and subsequent safety meetings were held to point out safer practices to the company and recommend closer screening of operating personnel prior to certification by the Department.

Mines Department.—All air-locomotives of the Crow's Nest Pass Coal Company were hydrostatically tested and certified. Copies of Inspectors' reports and certificates were forwarded to the Chief Inspector, Department of Mines. Through an interdepartmental arrangement of many years' standing, the Railway Department inspects surface trackage and equipment which is on the border line of jurisdiction between Mines and Railways. The haulage systems at the Sullivan mine and Britannia Beach come under the foregoing arrangement, and reports were submitted.

Pulp-mills and Industrial Plants.—Trackages and yards serving the pulp-mills and industrial sites were inspected, as were all motive power, cranes, and equipment serving industry. Operators, where necessary, were examined and certified. At Columbia Cellulose Company, close clearances were inspected and recommendations made. At Port Mellon the steam-locomotive was inspected, as well as barge-slip and trackage. Close clearances were also corrected at the Port Mellon plant. At Elk Falls Paper Company the barge-slip and steam-locomotive were inspected.

Shipyards.—At Yarrows Limited, Esquimalt, the Department was consulted as to lifting loads on a large hammer-head crane installed on its dock. Calculations were made and submitted, after which lifting and tipping tests were conducted and the crane certified for operation. Trackage and cranes at other shipyards were inspected and equipment certified.

Kitimat.—During 1954 the Canadian National Railways has been constructing a 42-mile railway from Terrace to Kitimat to serve the new aluminium industry. This railway is to be operated by the Canadian National Railways, but the railway and yards at Kitimat are to be owned and operated by the Aluminum Company of Canada under the jurisdiction of the Department. In this regard the Department has advised the Aluminum Company regarding operational procedure and the hiring and certification of personnel to operate the railroad. At this writing two diesel-electric locomotives have arrived at Kitimat to supply motive power for the 3-mile interchange railway (with the Canadian National Railway) and to switch the extensive yards at the Kitimat mill-site.

Kemano Power-house.—The Alcan Power-house at Kemano was placed in operation during 1954 when it was officially opened by His Royal Highness the Duke of

Edinburgh. The Chief Inspector was on hand at the request of Alcan to officially inspect the aerial tramway over which His Royal Highness was to ride. The opening of the power-house finished the first phase of the construction at Kemano, where the Department had inspected all underground hoisting, railways, and aerial tramways, and advised the company on safety engineering regarding this work during construction. With construction completed, the tramway was turned over to Alcan to operate in conjunction with its power project. It was therefore necessary to formulate new operating rules and have them approved by Order in Council.

Federal Board of Transport.—All Department Inspectors are appointed by the Board of Transport Commissioners as locomotive inspectors to examine fire-protective appliances on all locomotives operating under the Board's jurisdiction within the Province. Railway passes are supplied by the Board through the Department of Lands and Forests, to whom copies of reports are submitted with originals of all reports sent direct to the Board of Transport Commissioners in Ottawa. Thus a liaison exists between the Federal Board of Transport Commissioners, the British Columbia Railway Department, and the Department of Lands and Forests.

With reference to the foregoing paragraph, 367 inspections were made of fire-protective appliances on the Canadian Pacific Railway, Canadian National Railway, and Great Northern Railway, and reports submitted, while 20 such inspections were made on the Pacific Great Eastern Railway and other industrial railways which were not reported to the Federal authority.

B.C. Electric.—On the B.C. Electric Railway, inspections and certifications were made of all diesel-electric and electric locomotives; tracks were inspected as well as shop facilities. In Vancouver, remaining street-cars and street-railways were inspected. Street-cars are being rapidly replaced by trolley-buses.

Trolley-buses.—Trolley-buses were not inspected, as there exists some doubt as to the Department's jurisdiction over these vehicles. It might be pointed out with regard to trolley-buses that, while they steer like a conventional bus and operate on rubber tires, they are not licensed as a motor-vehicle under the "Motor-vehicle Act," nor do they carry any type of licence-plate under the "Motor Carrier Act." It should also be pointed out that they have replaced street-cars and run on defined routes from overhead trolley-wires and the operators belong to the Street Railwaymen's Union. There is a school of thought that the inspection for public safety for these vehicles falls automatically under this Department's jurisdiction, but the matter has never been clarified.

Aerial Tramways.—All existing aerial tramways, with certain exceptions, operated to full capacity during 1954. The aerial tramways adjacent to Vancouver reported no serious accidents. All tramways were rigidly inspected several times during the year. Hollyburn Aerial Tramway was at a disadvantage in that only single chairs were used. The Department designed a double chair and through Order in Council approved new tower clearances on all tramways where approved chairs are used.

The Red Mountain Aerial Tramway near Rossland has given considerable difficulty. This tramway was in existence prior to the Department's jurisdiction over such matters and consequently design was not up to standard. Due to an accident in 1953 the Department suspended summer transportation of passengers on this tramway as all landings and stations were designed for snow conditions. It can be reported that the tramway is now in satisfactory condition and is being brought up to a higher standard. During an electrical storm the rope was damaged, which necessitated a special inspection by the Department's tramway engineer.

A new aerial tramway has been approved and has been under construction during 1954. This tramway is property of National Defence and, for security reasons, details are not given here; however, it can be reported that a substantial job has been completed in both design and construction, and the project will be operating in early 1955 subject to the Department's jurisdiction.

A very large and extensive areial tramway is being constructed at the Cassiar Asbestos Company near the northern boundary of the Province. Several hundred drawings have been approved by the Department and the project is well under construction, scheduled for completion in 1955, when final inspection will be made. This tramway is over 3 miles in length.

Truck Transportation.—As previously stated, there has been a definite trend, or change-over, on short rapid transit from rail to motor-truck. This has come about for three reasons: (1) Improvement in trucks operating on rubber tires, together with the perfection of high-speed automotive-type diesel engines; (2) improvement in road-building methods resulting from better trucks, engines, bulldozers, carry-alls, and other dirt-moving equipment; and (3) such roads with improved trucks are now feasible in heretofore inaccessible places. This being the case, industry, and more particularly the logging industry, has lost no time in adopting the newer methods, which in turn has boosted productivity and heavy industry in the Province.

The change-over has presented many safety problems to the operators, and companies formerly operating railways, to whom our services had been available, applied to have our same services extended to their trucks and truck-roads. It should be pointed out in most cases such companies have constructed their own private roads, over which public highway rules of the road do not in any way have jurisdiction.

The Department met the challenge by recommending improvements in air-brake systems and systematized inspection of vehicles by the company, but with no Act in force to back up the Inspectors, only as much could be done as the companies were willing to use to their own advantage. The greatest contributory cause to accidents, it was found, was that the operators of the new-type logging-trucks were in most cases displaced railroaders who knew nothing about handling air-brakes as used on trucks. The companies recognized this weakness on their part and requested the Department to train and certify all truck-drivers operating on their own logging-roads. This was a concerted request by all the larger companies to which the Department directed its efforts.

Truck-driver Certification.—It was necessary to procure films and necessary literature and have the Inspectors in the course of their normal travels put on lectures and training courses in the various camps and logging centres. During 1954 forty such lectures were conducted at various points in the Coast Region, and, as a result, 95 logging-truck operators were examined and certified during 1954, with 117 during 1953 and 65 in 1952, making a total of 277 logging-truck drivers who operate on private roads trained and certified to date.

The industry as a whole has found that the safety of operations has been increased, so that all of the larger companies have applied to the Department to have the industrial transportation (not on public highways) brought under the control of an Act similar to the "Railway Act."

Highway-driver Training.—Training courses made available to the logging industry were quickly recognized by the Royal Canadian Mounted Police as being beneficial to drivers of equipment on public highways, and application was made by personnel of the Royal Canadian Mounted Police to the Department to have our training and a form of certification extended to the public highways on Vancouver Island. As a result, a concerted effort was made by the Royal Canadian Mounted Police, the Public Works Department, the Motor-vehicle Branch, and the Railway Department so that highway drivers could attend the forty special lectures conducted for drivers on private roads. R.C.M.P. officers sponsored the meetings, provided the halls, and registered the drivers. Over 1,000 drivers took the courses, and ultimately 539 highway drivers were examined and certified under the auspices of Royal Canadian Mounted Police in addition to the 277 private-road drivers certified, making a total of 816 drivers who have been certified and registered with the Department. There is no doubt this has increased safety, courtesy, and efficiency on both private and public roads alike.

Traffic and Safety Councils.—To perpetuate the safety work instituted in the interests of public safety, the Department, under the sponsorship of the Royal Canadian Mounted Police, inaugurated five Traffic and Safety Associations at various centres on Vancouver Island, namely: Colwood, Duncan, Nanaimo, Port Alberni, and Courtenay. These associations are operated in the interest of highway safety entirely by public-spirited citizens. Their function is to further traffic safety and co-operate with law-enforcement bodies. They also bring dangerous conditions to the attention of City Councils so that conditions can be improved through amendments to by-laws.

A central council was needed through which all various local organizations could funnel requirements to Government departments. A Vancouver Island Traffic and Safety Council was therefore formed, consisting of two members of each group. This organization is now functioning to the best public interest. It is recommended this council receive all possible help from Government departments and officials concerned.

Railway Safety.—Railway safety being the cardinal tenet of this Department, safety programmes were sponsored and encouraged in various parts of the Province. This was carried out in three principal ways: (1) Obtaining films and literature for company meetings, (2) by our Inspectors giving lectures and film showings, and (3) encouraging company safety drives and offering trophies. The last method is considered superior as it is a proven principle in human behaviour that anything good for a group of people must be fought for and won by the people themselves. It follows, then, that a good thing cannot be forced upon people as they will not accept it. This principle has been applied wherever possible so that employees will demand of the employer safer conditions under which to work.

Three trophies are put up by the Department: (1) A safety shield for the logging-railways, (2) a cup for the mining-railways, and (3) a trophy for the Pacific Great Eastern Railway which is competitive between divisions. In 1952 the Canadian Forest Products (Englewood Division) held the logging trophy but lost it in 1953 to the Comox Logging and Railway Company Ladysmith operation. This trophy has not yet been awarded for 1954. The mining-railway trophy has been held since 1952 by the Morrissey, Fernie and Michel Railway at Fernie, and the P.G.E. trophy instituted in 1953 has not yet been awarded for 1954.

It can be reported the industrial railways show a keen sense of competition in safety matters; however, on the Pacific Great Eastern Railway the company should set up its own safety department. A railway safety car would be an advantage. This car could also be used for air-brake instruction, first-aid instruction, and rule-book instruction. The company could then hold regular safety meetings, and Department Inspectors, whenever available, could lecture and assist. Most companies employ a safety director, which procedure is recommended wherever possible.

Accidents.—An unfortunate accident occurred December 17th, 1954, on the Franklin River Railway of MacMillan & Bloedel Limited when, due to inclement weather, a bridge washed out and two men were drowned. Our investigation revealed that the bridge had been inspected an hour prior to the train's arrival, flood conditions prevailing at the time had underscoured a tower bent, and the bridge collapsed when the locomotive was on the span, drowning the engineer and head-end brakeman.

A fatal accident was investigated at Sullivan mine, Kimberley, where a workman was fatally injured between a railway-car and the dumper. It appeared that the deceased was endeavouring to retrieve a tail-light and placed himself where workmen were forbidden to enter. Recommendations were made and the special rules for this railway are being revised.

Several logging-truck accidents were investigated, and in most cases were found to be caused by lack of knowledge and training on the part of the drivers in the use of air-brakes.

In summarizing all accidents investigated, it is the consensus of opinion that the best safety device is a safe workman; consequently, our safety educational and certification programme should be carried forward in perpetuity for the future.

Following is a report of equipment inspections during 1954:—

Hydrostatic tests applied to boilers	107
Internal and external inspections of boilers	7
Internal-combustion locomotives inspected and certified	39
Internal-combustion locomotive cranes inspected and certified	9
Air locomotives hydrostatically tested	9
Power rail-cars inspected and certified	32
Air-receivers tested and inspected	10
Diesel-electric locomotives inspected and certified	34
Electric locomotives inspected on narrow-gauge electric railways	14
Electric locomotives inspected on Alcan project	6
Locomotives inspected other than hydrostatic tests	31
Number of cars inspected on industrial railways	500
Number of cars inspected on common-carrier railways	115
Miles of underground trackage inspected at Alcan project	18
Miles of track inspected	750
Aerial tramways inspected in British Columbia	5
Aerial tramway inspections conducted	14
Locomotive engineers examined and certified	7
Conductors examined and certified	7
Power-car operators examined and certified	8
Train-dispatchers examined and certified	1
Air-brake inspectors examined and certified	1
Internal-combustion locomotive engineers examined and certified	1
Engineers examined and certificates issued, Pacific Great Eastern Railway	4
Electric-locomotive operators examined and certified, Consolidated Mining & Smelting Co. of Canada Ltd.	20
Motormen and underground hoistmen examined and certified, Morrison-Knudsen Co. of Canada Ltd.	54
Logging-truck operators examined and certified	95
Truck-drivers on highways examined under auspices of Royal Canadian Mounted Police	539
B.C. Electric Railway street-cars inspected	8
B.C. Electric Railway diesel and electric locomotives inspected and certified	16
Accidents on B.C. Electric Railway	2
Accidents investigated on logging and industrial railways	3
Fatal accidents on logging and industrial railways	2
Accidents on logging-truck roads investigated	1
Accidents on Pacific Great Eastern Railway	12
New diesel-electric locomotives	2
Reservoirs constructed under Department supervision	5
Safety lectures conducted by the Department	7
Truck air-brake lectures conducted by the Department	40
Inspections made of fire-protective appliances on Pacific Great Eastern Railway and industrial railways	20
Inspections made of fire-protective appliances on locomotives of C.P.R., C.N.R., and G.N.R. for Board of Transport Commissioners	367

LIST OF APPENDICES

A list of Executive Council certificates issued is given in Appendix A.

Accidents on railways are shown in Appendix B.

A list of locomotive cranes in industrial plants inspected by the Department is shown in Appendix D.

A summary of the mileage of all railways operating in the Province is shown in Appendix E.

APPENDICES

APPENDIX A

CERTIFICATES ISSUED UNDER THE PROVISIONS OF THE "RAILWAY ACT"

	Certificate No.
Approving application of Howe Sound Pulp Co. Ltd., Port Mellon, B.C., for exemption from standard clearances	830
Approving notice served by Chief Inspector of Railways upon Canadian National Railways condemning trestle of L & K Lumber (North Shore) Ltd.	831
Granting request of Pacific Great Eastern Railway for approval of uniform code of operating rules	832
Approving application of MacMillan & Bloedel (Alberni) Ltd. to construct bridge over Nitinat River, Barclay District	833
Granting application of Pacific Great Eastern Railway for an extension of five years for the completion of the railroad	834
Granting B.C. Electric Railway Co. Ltd. permission to construct a spur track across Wilson Avenue and John Street, Municipality of Burnaby	835
Approving issue by B.C. Electric Railway Co. Ltd. of 4¾-per-cent general mortgage bonds, 1954 series	836
Granting B.C. Electric Railway Co. Ltd. permission to relocate whistle-boards on District III, New Westminster to Chilliwack lines	837
Granting B.C. Electric Railway Co. Ltd. permission to construct spur track across Ewen Avenue and Stanley Street, City of New Westminster	838
Granting B.C. Electric Railway Co. Ltd. permission to construct and carry a team track across Hazel Street, Village of Abbotsford	839
Amending Rules and Regulations, Part XI, Governing the Location, Construction, and Operation of Aerial Tramways, by amending Rule 41	840
Granting application of Pacific Great Eastern Railway for approval of Form 194B	841
Approving application of Department of Public Works for leave to construct a highway crossing over tracks of Pacific Great Eastern Railway spur at Squamish	842
Approving application of Pacific Great Eastern Railway Co. to increase share capital of company from $25,000,000 to $90,672,900	843
Approving special rules and regulations of the Aluminum Co. of Canada Ltd. for operation of aerial tramway at Kemano	844
Approving B.C. Electric Railway Co. Ltd. application to construct a spur track across Twentieth, Fourteenth, and Eighteenth Streets, Municipality of Burnaby	845

APPENDIX B

ACCIDENTS REPORTED, 1954

On Railway

	Killed	Injured
B.C. Electric Railway Co. Ltd.—		
Passengers	----	14
Employees	----	1
Other persons	----	19
Pacific Great Eastern Railway Co.—		
Passengers	----	----
Employees	----	7
Other persons	----	3
Industrial railways—		
Employees	3	2
Other persons	----	----
Locomotive cranes—Employees	----	----
Aerial tramways (industrial)	----	----
Totals	3	46

Level Crossings

	Unprotected Crossing			Protected Crossing		
	Killed	Injured	Number of Accidents	Killed	Injured	Number of Accidents
Under jurisdiction of the Provincial Government—						
After sunrise	----	7	5	----	----	----
After sunset	----	----	----	----	----	----
Totals	----	7	5	----	----	----
Under jurisdiction of the Board of Transport Commissioners for Canada—						
After sunrise	3	5	7	----	7	3
After sunset	----	16	9	----	4	1
Totals	3	21	16	----	11	4
Total number of accidents in British Columbia	3	28	21	----	11	4

APPENDIX C

List of Railways and Summary of Mileage

Industrial Railways

No. and Owners/Name of Railway	Head Office	Operating	Mileage			Gauge
			Main Track	Sidings, etc.	Total	
Standard Gauge						
Mainland						
1. Begbie Pole-yard	Revelstoke	Begbie	0.92	----------	0.92[1]	Standard.
2. Crow's Nest Pass Coal Co. Ltd.	Fernie	Fernie, Coal Creek, Elk River, and Michel	7.15	----------	7.15	,,
3. Columbia Cellulose Co. Ltd.	Vancouver	Watson Island	----------	5.08	5.08[1]	,,
4. Dominion Tar & Chemical Co. Ltd.	Montreal	North Vancouver	1.00	7.00	8.00	,,
5. Morrissey, Fernie & Michel Railway Co.	Fernie	Fernie, Coal Creek, and Elk River	3.62	2.73	6.35	,,
6. O'Brien Logging Co. Ltd./Northern & Eagle River	Vancouver	Stillwater	4.50	0.50	5.00	,,
7. Pacific Coast Terminals Co. Ltd.	New Westminster	New Westminster	5.20	----------	5.20	,,
8. Kelley Logging Co. Ltd.	Vancouver	Aero	8.00	12.00	20.00	,,
9. Canada Creosoting Co. Ltd.	Montreal	North Vancouver	----------	0.75	0.75	,,
Totals, Mainland			30.39	28.06	58.45	
Vancouver Island						
10. MacMillan & Bloedel Ltd.	Vancouver	Franklin River	47.00	4.50	51.50	,,
11. B.C. Forest Products Ltd.	Vancouver	Youbou	22.50	3.90	26.40[2]	,,
12. B.C. Forest Products Ltd./Renfrew Division, South	Vancouver	Port Renfrew	16.50	6.00	22.50	,,
13. B.C. Forest Products Ltd./Renfrew Division, North	Vancouver	Port Renfrew	12.00	1.00	13.00	,,
14. Canadian Collieries (D.) Ltd./Wellington Colliery Railway	Union Bay	Union Bay	1.00	----------	1.00	,,
15. Canadian Forest Products Ltd.	Vancouver	Englewood	88.37	13.07	101.44	,,
16. Comox Logging & Railway Co.	Ladysmith	Ladysmith	23.40	5.05	28.45	,,
17. Hillcrest Lumber Co. Ltd.	Mesachie Lake	Mesachie Lake	6.00	1.50	7.50[2]	,,
18. MacMillan & Bloedel Ltd./Copper Canyon Railway (Camp No. 1)	Chemainus	Chemainus, Seymour, Cowichan Lake District	----------	5.00	5.00	,,
19. MacMillan & Bloedel Ltd./Nanaimo River Railway	Chemainus	Dunsmuir District	1.00	3.10	4.10	,,
20. Mayo Lumber Co. Ltd.	Paldi	Paldi	0.50	0.25	0.75	,,
21. Osborn Bay Wharf Co. Ltd.	Mesachie Lake	Crofton	0.33	----------	0.33	,,
22. Western Forest Industries Ltd./Gordon River	Vancouver	Cowichan Lake District	7.00	0.50	7.50[3]	,,
Totals, Vancouver Island			225.60	43.87	269.47	
Queen Charlotte Islands						
23. Powell River Co. Ltd.	Vancouver	Cumshewa	7.00	15.00	22.00	,,
Totals, industrial railways, standard gauge			262.99	86.93	349.92	

APPENDIX C—*Continued*

LIST OF RAILWAYS AND SUMMARY OF MILEAGE—*Continued*

Industrial Railways—Continued

No. and Owners/Name of Railway	Head Office	Operating	Mileage			Gauge
			Main Track	Sidings, etc.	Total	
NARROW GAUGE						
Mainland						
24. Britannia Mining & Smelting Co. Ltd./Tunnel Railway	Britannia Beach	Britannia Beach	3.17	1.79	4.96	36″
25. Consolidated Mining & Smelting Co. of Canada Ltd.	Trail	Trail	20.00	---- ----	20.00	18″
26. Consolidated Mining & Smelting Co. of Canada Ltd.	Trail	Sullivan mine	9.00	32.70	41.70	18″, 36″
27. Dominion Tar & Chemical Co. Ltd.	Montreal	New Westminster	3.00	----------	3.00	30″
			3.00	----------	3.00[1]	Standard.
Totals, Mainland			38.17	34.49	72.66	
Vancouver Island						
28. Canadian Industries Ltd.	Montreal	James Island	8.25	1.75	10.00	36″ and standard.
Totals, Vancouver Island			8.25	1.75	10.00	
Totals, industrial railways, narrow gauge			46.42	36.24	82.66	Standard and narrow.
Totals, all industrial railways in British Columbia			309.41	123.17	432.58	Ditto.
Common Carrier						
29. Pacific Great Eastern Railway	Vancouver	Vancouver, Squamish to Prince George—				
		Main line	430.80[4]	----------	----------	Standard.[4]
		Siding	----------	34.28	----------	,,
		Spurs, wyes, etc.	----------	20.01	----------	,,
		Private spurs	----------	11.83	----------	,,
Totals			430.80	66.12	496.92	
Street and Interurban Electric Railways						
30. B.C. Electric Railway Co. Ltd.	Vancouver	Vancouver and vicinity	91.88	18.40	110.28[5]	
Grand total					1,039.78	

[1] All leased.
[2] Includes 5 miles leased.
[3] Includes 7 miles leased.
[4] Includes 3.46 miles leased.
[5] Includes 61.70 miles leased.

APPENDIX D

List of Cranes and Other Auxiliary Motive Power in Industrial Plants Inspected by Railway Department

Alaska Pine & Cellulose Ltd.	Crane No. D.R. 304.
Alberta Lumber Co. Ltd.	Crane No. 42998 B.C.
Anderson Bros. Lumber Co. Ltd.	Crane No. 11905 B.C.
	Crane No. D.R. 302.
Arrowhead Wood Preservers Ltd.	Crane No. D.R. 293.
	Crane No. D.R. 322.
	Crane No. 22633 B.C.
Associated Foundry Ltd.	Crane No. D.R. 305.
Baxter, J. H., & Co. Ltd.	Gas Crane No. 1.
B.C. Cement Co. Ltd.	Crane No. 21439 B.C.
B.C. Forest Products Ltd. (Sawmill)	Crane No. D.R. 320.
Bridge & Tank Co.	Crane No. 12669 B.C.
Burrard Dry Dock Co. Ltd.	Crane No. 50514 B.C.
	Crane No. D.R. 292.
	Gas Locomotive Crane No. 4.
Canadian Bridge Co.	Crane No. D.R. 346.
	Crane No. 12330 B.C.
Capital Iron & Metals Ltd.	Crane No. D.R. 295.
	Crane No. 44386 B.C.
Columbia Cellulose Co. Ltd.	Diesel-Electric Locomotive No. 1.
Consolidated Mining & Smelting Co. of Canada Ltd.—	
Kimberley	Electric Locomotives Nos. 1, 2, 3.
Trail	12 narrow-gauge electric locomotives.
Dobson Bros.	Crane No. D.R. 289.
Dominion Bridge Co. Ltd.	Crane No. 44129 B.C.
	Crane No. 44317 B.C.
	Crane No. D.R. 347.
	Crane No. 44013 B.C.
	Gas Locomotive No. 1.
Dominion Tar & Chemical Co. Ltd.	Crane No. 44441 B.C.
	Gas Switcher No. 1.
	Crane No. D.R. 283.
	Gas Locomotive Crane No. 6.
Esquimalt Dry Dock	Crane No. 22582 B.C.
	Portable Boiler D.R. No. 314.
Hillcrest Lumber Co. Ltd. (Sawmill)	Crane No. 40049 B.C.
	Crane No. 44315 B.C.
	Crane No. 41298 B.C.
King, M. B., Lumber Co. Ltd.	Crane No. 12430 B.C.
Leber Pole & Piling Co.	Gas Crane No. 1.
Lions Gate Lumber Co. Ltd.	Crane No. 12370 B.C.
Lumby Timber Co. Ltd.	Crane No. D.R. 343.
Mayo Lumber Co. Ltd.	Crane No. D.R. 321.
MacMillan & Bloedel Ltd. (Sawmill)	Crane No. 44666 B.C.
	Gas Internal-combustion Locomotive No. 50.
	Diesel-Electric Locomotive No. 1.
Northern Construction Co. Ltd.	Crane No. 43505 B.C.
Osborn Bay Wharf Co. Ltd.	Crane No. 21526 B.C.
Prince Rupert Drydock & Shipyard	Crane No. D.R. 290.
Sigalet & Co. Ltd.	Crane No. 21089 B.C.
Sooke Lake Lumber Co. Ltd.	Crane No. 22632 B.C.
Timber Preservers Ltd.	Crane No. 43807 B.C.
	Crane No. D.R. 288.
Timberland Lumber Co. Ltd.	Crane No. 12368 B.C.
Vancouver Steel Co. Ltd.	Crane No. D.R. 316.
	Crane No. D.R. 342.
Victoria Machinery Depot Ltd.	Crane No. D.R. 291.
Western Bridge & Steel Fabricators Ltd.	Crane No. D.R. 355.
	Crane No. D.R. 309.
Western Plywoods Ltd.	Diesel Crane No. 142.
Yarrows Ltd.	Electric dock crane.

BRITISH COLUMBIA

APPENDIX E

MILEAGE OF ALL RAILWAYS OPERATING IN THE PROVINCE

	Mainland		Island		Total	
	Main Line	Sidings	Main Line	Sidings	Main Line	Sidings
Under the jurisdiction of the Board of Transport Commissioners for Canada—						
Canadian Pacific Railway	1,858.31	527.06	197.81	46.51	2,056.12	573.57
Canadian National Railways	1,302.34	366.40	90.17	24.28	1,392.51	390.68
Great Northern Railway	140.77	42.00	----------	----------	140.77	42.00
B.C. Electric Railway (leased)	26.06	23.73	----------	----------	26.06	23.73
Totals	3,327.48	959.19	287.98	70.79	3,615.46	1,029.98
Under the jurisdiction of the Provincial Government—						
Pacific Great Eastern Railway	430.80	66.12	----------	----------	430.80	66.12
B.C. Electric Railway	91.88	18.40	----------	----------	91.88	18.40
Industrial railways—						
Standard gauge	30.39	28.06	225.60	43.87	255.99	71.93
Standard gauge, Queen Charlotte Islands	7.00	15.00	----------	----------	7.00	15.00
Narrow gauge	38.17	34.49	8.25	1.75	46.42	36.24
Totals	598.24	162.07	233.85	45.62	832.09	207.69
Grand totals	3,925.72	1,121.26	521.83	116.41	4,447.55	1,237.67

Total mileage of all railways in British Columbia, 5,685.22.

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