

INTERSTATE COMMERCE COMMISSION

REPORT OF THE CHIEF INSPECTOR OF SAFETY APPLIANCES COVERING HIS INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE NORTHERN PACIFIC RAILWAY NEAR LAKE- VIEW, WASH , ON MAY 12, 1913

July 10, 1913

To THE COMMISSION

On May 12 1913 there was a derailment of a passenger train of the Oregon-Washington Railroad & Navigation Co near Lakeview, Wash , while running over the tracks of the Northern Pacific Railway resulting in the death of 3 passengers and 1 employee and the injury of 7 passengers. In connection with the investigation of this accident a public hearing was held at Tacoma, Wash , on May 14, 1913 conducted jointly by representatives of the Public Service Commission of Washington and the Interstate Commerce Commission. As a result of the investigation of this accident I beg to submit the following report.

East-bound train No 362 consisted of 3 refrigerator cars, 1 combination baggage and express car, 3 day coaches, 1 dining car, 1 Pullman sleeping car, and 1 observation car hauled by locomotive No 201 in charge of Conductor Kramer and Engineman Dunlap. The first refrigerator car was of steel underframe construction and the next two were of wooden construction while the combination car and the coaches were of all-steel construction. The dining car was of wood, the sleeping car had a steel underframe and the observation car was of all-steel construction. All the cars were equipped with high-speed brakes, excepting the second and third refrigerator cars. This train was en route from San Francisco, Cal, to Seattle, Wash, as Southern Pacific train No 16 to Portland, and as train No 362 of the Oregon-Washington Railroad & Navigation Co from Portland to Seattle running over the tracks of the Northern Pacific Railway between Vancouver, 10 miles east of Portland and Tacoma, Wash, 142 miles from Portland. Train No 362 passed Lakeview, 8.2 miles west of Tacoma at 1:48 p. m. being 38 minutes late at the time and at about 1:50 p. m. was derailed at a point a little more than 1 mile beyond Lakeview while running at a speed estimated to have been about 60 miles per hour.

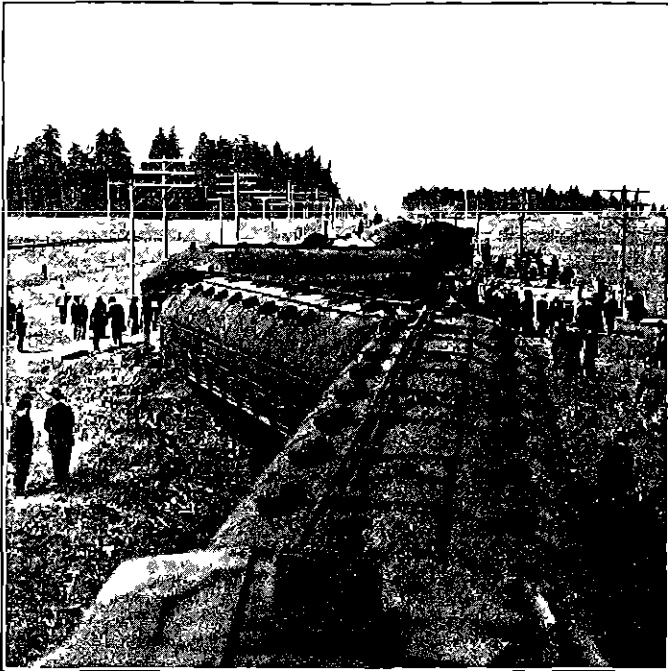
The engine, tender, and first seven cars were derailed, together with the forward trucks of the dining car the balance of the train remaining on the rails. Illustration No 1 shows the position of the engine, tender, refrigerator cars, and the combination car. Illustration No 2 is a view taken from the roof of the dining car and shows the manner in which the coaches came to rest. The forward end of the first coach was crushed on the north side a distance of about 20 feet by the rear end of the combination car, the south side of the coach, with the exception of the vestibule, being practically intact. The position of this coach and the combination car after the accident seemed to indicate that when the trucks were knocked from



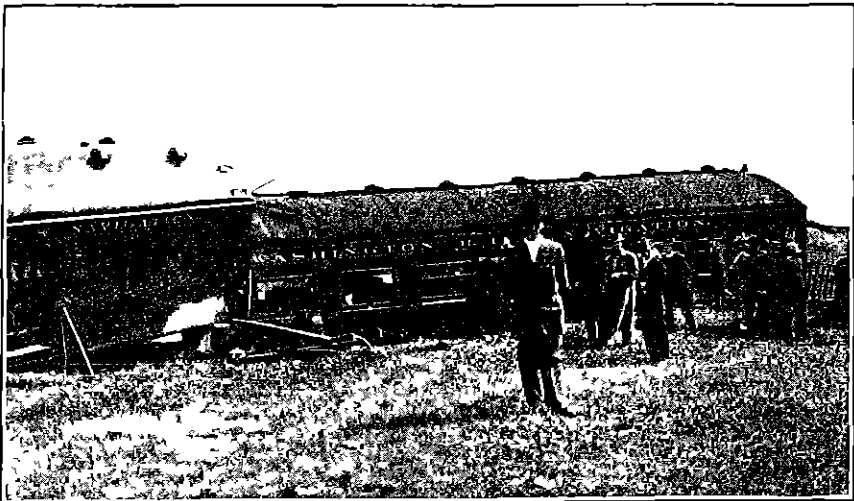
No 1—General view of accident looking in westerly direction

under the forward end of the coach that end dropped down until the bottom of the body of the combination car was on a level with the tops of the seats in the coach, the combination car apparently having an upward tendency at the time. All of the fatalities occurred in the forward end of the coach. Aside from this coach the principal damage to the cars was limited to the vestibules and trucks. Illustration No 3 shows the coach damaged by the combination car while illustration No 4 shows the end of the coach after the latter had been removed from the scene of the accident. The speed of the train at the time of the accident 60 miles per hour was the limit allowed at this point by the speed restrictions contained in the time-card of the Northern Pacific Railway.

This division of the Northern Pacific Railway is a single-track line used jointly by trains of the Northern Pacific Railway, Oregon-



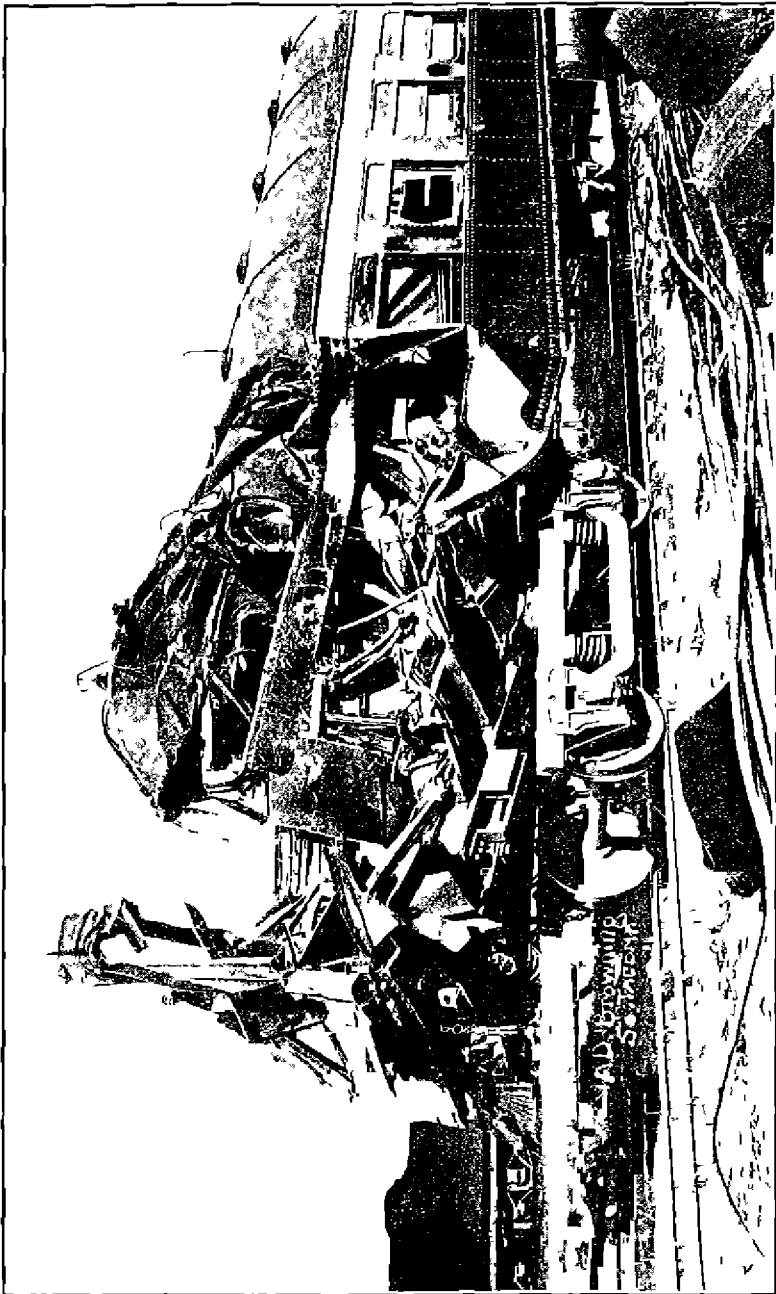
No. 2 —View looking in easterly direction, taken from roof of dining car



No. 3 —Side of steel coach crushed on forward end by steel combination car

Washington Railroad & Navigation Co and the Great Northern Railway. Approaching the scene of the accident the grade is slightly

descending although right at the point of the derailment it is slightly ascending. Approaching from the west the track is straight for

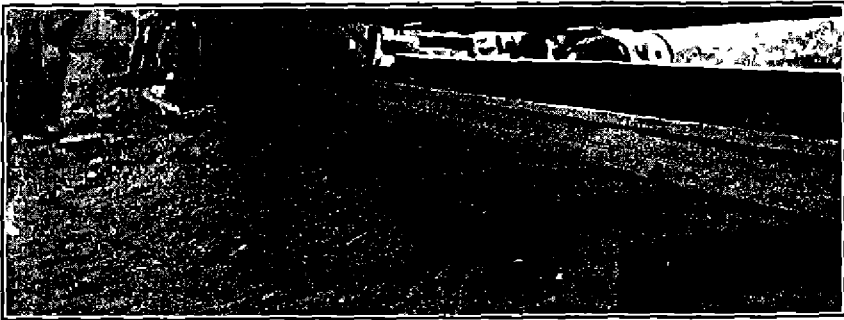


No. 1 Steel coach after removal from scene of accident

several miles then there is a 1° curve 850 feet in length leading to the right followed by another stretch of straight track. It was on

this second stretch of straight track at a point about 1,700 feet beyond the end of the curve that the derailment occurred. The track at this point runs through a slight cut varying in depth. It is laid with 85-pound steel rails, 33 feet in length, laid in 1908, four-hole angle bars being used. On an average there are 19 fir ties under each rail, single spiked, Wolhaupter tie-plates being used. The greater part of the material constituting the roadbed is gravel, the remainder being a mixture of cinders and black dirt. The drainage at this point is good. The point of derailment was about 500 feet east of the western end of the Puget Sound Division.

On examination of the track after the accident the first marks of derailment were found under the dining car at a point 512 feet west of the pilot of the engine. These marks consisted of wheel marks on the inside of the web of the left-hand rail, 5 feet 6 inches from its receiving end. These initial marks were such as to indicate that only a few wheels, or possibly one wheel, had traveled



No 5—View showing leaving end of rail A and intact portion of receiving end of rail B

on the rail. The marks then increased in number until at the leaving end of this rail, referred to hereafter as rail "A," it was apparent that a number of wheels had been running upon the web. This rail was forced outward and over until at its leaving end the ball of the rail rested upon the ties, four of which under this end being marked by the ball. The rail adjoining rail A on the east, hereafter referred to as rail "B," was broken at a point 8 feet 4 inches from its receiving end. The break was a fresh one, and examination indicated that it was a result of and not the cause of the derailment. The distance from the first wheel marks on the left-hand rail to a point opposite where the wheels left the right-hand rail was 21 feet 6 inches. The course of the derailment could not be traced east of the broken end of rail B on account of the track being badly torn up.

Illustration No 5 is a view looking toward the east, and shows rail A nearly upright, together with the receiving end of rail B.

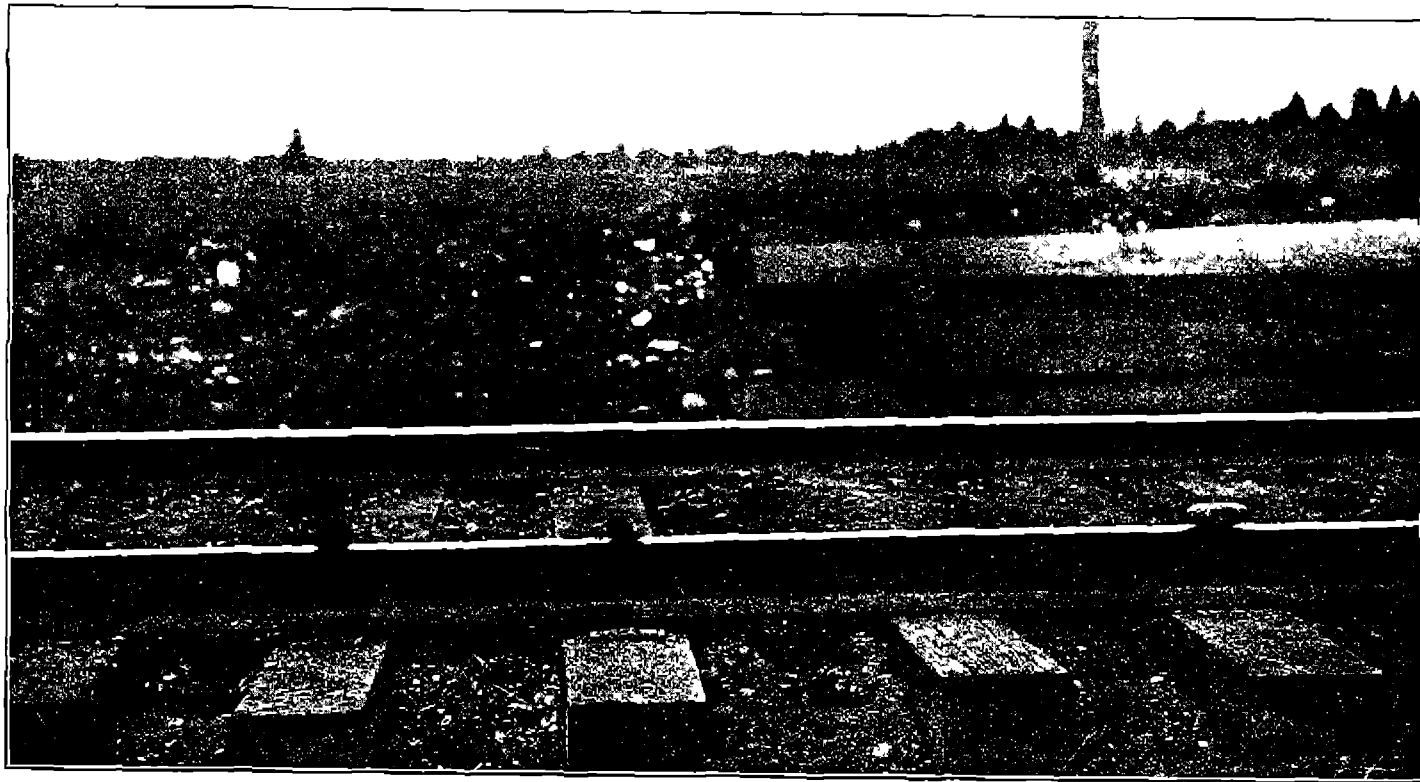
Close examination of the illustration will reveal the marks of the ball of rail A upon the ties near its leaving end

At the hearing Engineman Dunlap testified that on approaching the scene of the accident he saw no slow flag or signal of any kind to indicate that the track was not safe for high speed. When the engine reached a point near where the section men were working it began to roll. In describing this rolling motion he stated that the engine leaned toward the left and the front seemed to dip down slightly. It then came back and again started to lean to the left and did not straighten up tipping over on its side. Before starting on this trip Engineman Dunlap noted that the flanges were in good condition, while careful examination made of the engine when it was rerailed after the accident failed to disclose any defect which could have caused the accident.

Engine No. 201 was of the Pacific type weighing 149,020 pounds on its driving wheels the engine and tender having a combined weight ready for service of 394,420 pounds.

On the day of the accident section men were engaged in making the annual renewal of ties. Examination of the track showed that in a distance of 16 rail lengths west of the point of derailment 46 ties had been replaced very few of which were spiked. The tamping of these ties had not been completed, and several of them had settled away from the rails, this settling apparently being due to the fact that several trains had passed over the track after they had been put in. Illustration No. 6 is a view of the track at a point about 185 feet west of the dining car, and shows how the new ties settled away from the rail. Just east of where the locomotive stopped were found additional ties with the ballast removed and the spikes drawn preparatory to removal. This condition can be seen by examination of illustration No. 1. All the spikes were found to have been drawn from both ties at the rail joint which connected rail A with the rail next to it on the west. The spikes were also drawn and the ballast removed from three other ties under rail A as well as from the first tie under the receiving end of rail B. From this point eastward no detailed information was obtainable on account of the roadbed being torn up by the derailment. The examination also disclosed the fact that many tie plates were embedded even with and in some cases below, the tops of the ties.

About two hours after the occurrence of the accident the engineer of maintenance of way of the Northern Pacific Railway made an examination of the track from the point of derailment west to the end of the observation car 5 rail lengths west of rail A. Proceeding in a westerly direction from rail B unspiked ties were found as follows: Rail A 4 first rail west of rail A 7 second rail, 4 third



No 6—View showing how new ties settled away from rails, on account of tamping and spiking not being completed

rail, 7, fourth rail, 2, fifth rail, 2 Of the 7 ties under the first rail west of rail A 5 out of 6 successive ties were unspiked, while under the third rail 4 out of 5 successive ties were in this condition In view of the fact that the unspiked ties under rail A were old ties, and that the first 4 unspiked ties under the first rail were also old ties, the remaining ties under these rails being new, it would appear, notwithstanding the statement of the section foreman to the contrary, that the section men had started at the western end of the Puget Sound Division and, working in an easterly direction, had removed the spikes and ballast from the ties to be renewed, and had then started in again at the westerly end and were working back toward the east, taking out the old ties and putting in the new ones, intending to finish the ballasting and spiking of the new ties after all of them had been placed in the track It is of course entirely possible that the spikes were drawn by men working ordinarily a rail length or two in advance of those who were replacing the old ties by new ones, but the fact remains that the ballasting and spiking of the new ties had not reached a point nearer than 200 feet of where the derailment occurred, at which point ties were found without spikes or ballast No detailed information was available as to whether or not any of the new ties west of the observation car were unspiked at the time of the derailment

The track surface was irregular and uneven for a distance of several hundred feet west of the point of derailment Beginning at the western end of the Puget Sound Division, and extending in an easterly direction to the point where a temporary turnout was built around the wreckage, a distance of 9 rail lengths, measurements were made at each rail center and joint There was found to exist a variation in track levels of from $\frac{1}{8}$ inch to $1\frac{1}{2}$ inches, and at only 3 of the 18 points at which measurements were taken were the rails found to be level

Rule No 929 of the Northern Pacific Railway book of rules, referring to the duties of section foremen, provides in part as follows

When the track is to be made unsafe for trains at usual speed a flagman will be stationed at a distance of not less than three-quarters of a mile (130 rail lengths) on each side of the point of obstruction and where there is an unobstructed view for at least a quarter of a mile beyond Two torpedoes will be placed on the rail 60 feet apart on the engineman's side 10 rail lengths beyond the flagman On the approach of a train the flagman will display caution signals until acknowledged by the engineman in accordance with rule 14 (g)

At a distance of not less than 35 rail lengths on each side of the point of the obstruction a red flag by day or a red light by night will be placed on the engineman's side where it can be plainly seen by an approaching train, and, in addition, two torpedoes will be placed on the rails opposite each other so as to make one explosion These stop signals must not be removed until track has been made safe for trains to proceed without stopping

Section Foreman Antrim stated that no flagman had been sent out because he did not think the existing track conditions necessitated the use of warning signals as provided by rule No 929, neither did he think that the track conditions had anything to do with the derailment, these conditions having been practically the same for two hours prior to the derailment, during which time four passenger trains had passed over the track in safety. He did not think, however, that they were traveling as fast as the derailed train. In making tie renewals it was his practice to have two men draw the spikes from an old tie and replace it at once with a new tie, although it might occasionally happen that the spikes would be drawn from a few ties in advance of where the men were renewing the ties. The method he was following in renewing the ties was the one he had followed for the past two weeks. He stated that it was not his practice to remove the spikes from all old ties to be renewed, then replace them with new ties, and leave the spiking of the same until all the new ties had been replaced. He stated further that his men had not worked east of where the engine lay, work on this part of the track having been finished about a week previously.

The track in this vicinity was ballasted about 12 years ago, and testimony was introduced to show that it was, in its existing condition, safe for a speed of 60 miles per hour.

Roadmaster Donovan, employed by the Oregon-Washington Railroad & Navigation Company said that although the track was not in first-class condition yet it was not bad enough to call for slow orders. He said that when the spikes were removed from the four ties under rail A that rail was weakened to some extent and there would be a possible tendency of the rail to move outward under pressure the rails on the lower side of the track having a greater tendency in this direction. He further testified that he considered it better to use slow flags when doing work of this character, but that these matters were generally left to the individual discretion of each section foreman.

The engineer of maintenance of way of the Northern Pacific Railway, Mr. Perkins testified that when he examined the track he found nothing to indicate an unsafe condition. He stated that many more ties are placed in track than are absolutely necessary. In fact, in general practice the track is four or five times as strong as is theoretically considered necessary on account of the desire to take care of any unusual conditions which might arise from time to time. He thought the removal of the ties under rail A would decrease the factor of safety, but in the condition in which the track was maintained their removal would still leave a large margin of safety.

Summarizing the circumstances leading up to this accident, it is believed that the section men engaged in the annual renewal of ties

had begun at the extreme western end of the division and had worked in an easterly direction, drawing the spikes and removing the ballast from the ties to be renewed, then removing the old ties and putting in the new ties, intending to spike the rails to the new ties when all of the latter had been put in place, that the new ties had been placed in at least 450 feet of track at the time of the approach of train No 362, that since the new ties had been placed in this short stretch of track several trains had passed over it and had caused many of the new ties, which were not spiked to the rails and under which the tamping had not been finished, to settle away therefrom, resulting in the surface of the track being in an uneven condition, that when the locomotive of train No 362 reached this stretch of track, running at a speed of 60 miles per hour, it began to rock on account of the uneven condition of the track, and that when it reached the rail referred to as rail A the rocking motion placed such an outward pressure upon that rail as to cause it to be pushed outward and over, resulting in the derailment of the train

This accident was caused by uneven and insecure track conditions, which would not permit the safe movement of passenger trains at their usual speed, and by the failure of the track foreman to adopt necessary precautions to insure the movement of trains over the insecure track at reduced speed

That part of rule No 929 previously quoted leaves to the judgment of the individual section foreman the question of whether or not the work being done by him necessitates the use of a slow flag Section Foreman Antrim was 62 years of age and a man of much experience in track work, having been a section foreman and extra gang foreman on the Northern Pacific Railway for 29 years Using the judgment he possessed as a result of his years of experience, he decided that the work being done by his men did not require the use of a slow flag, and the result of this error of judgment was the derailment of train No 362 The requirements of rule No 929 relative to the use of slow flags are not definite While it is realized that in railway operation conditions arise the proper handling of which must be left to the judgment of the individual employee, yet it is believed that this rule should definitely provide that trains be warned when the track is undergoing such extensive repairs as was the case in this instance, not leaving it entirely to the judgment of the foreman to decide whether or not the work being done necessitates the use of warning signals

Respectfully submitted

H W BFLNAP,
Chief Inspector of Safety Appliances

