INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE MISSOURI PACIFIC RAILROAD NEAR LAWRENCE NEBR., ON DECEMBER 10, 1931.

January 23, 1932

To the Commission:

On December 10, 1931, there was a derailment of a mixed train on the Missouri Pacific Railroad near Lawrence, Nebr., which resulted in the death of 2 employees and the injury of 1 passenger and 1 employee

Location and method of operation

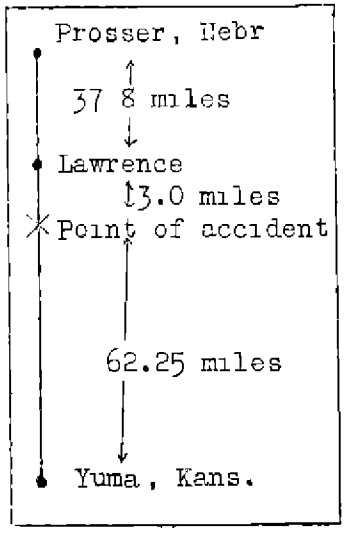
This accident occurred on the Prosser District of the Northern Kansas Division, extending between Yuma, Kans., and Prosser, Nebr , a distance of 103.05 miles, in the vicinity of the point of accident this is a single-track line over which trains are operated by time-table and train orders, no block-signal system being in use. The accident occurred about 3 miles east of Lawrence, or at a point 190 feet east of highway bridge No. 45, the bridge is a seven-panel pile trestle, 100 feet in length and about 25 feet in height, which carries the track over a county road. Approaching the point of accident from the east, the track is tangent for a distance of 1,898 feet, and then there is a 3°curve to the left 700 feet in length, 300 feet of tangent, and a 2° curve to the right 800 feet in length, the accident occurring on this latter curve at a point 40.3 feet from its eastern end, at which point there is a fill about 10 feet in height The grade is 1.02 per cent descending for westbound trains.

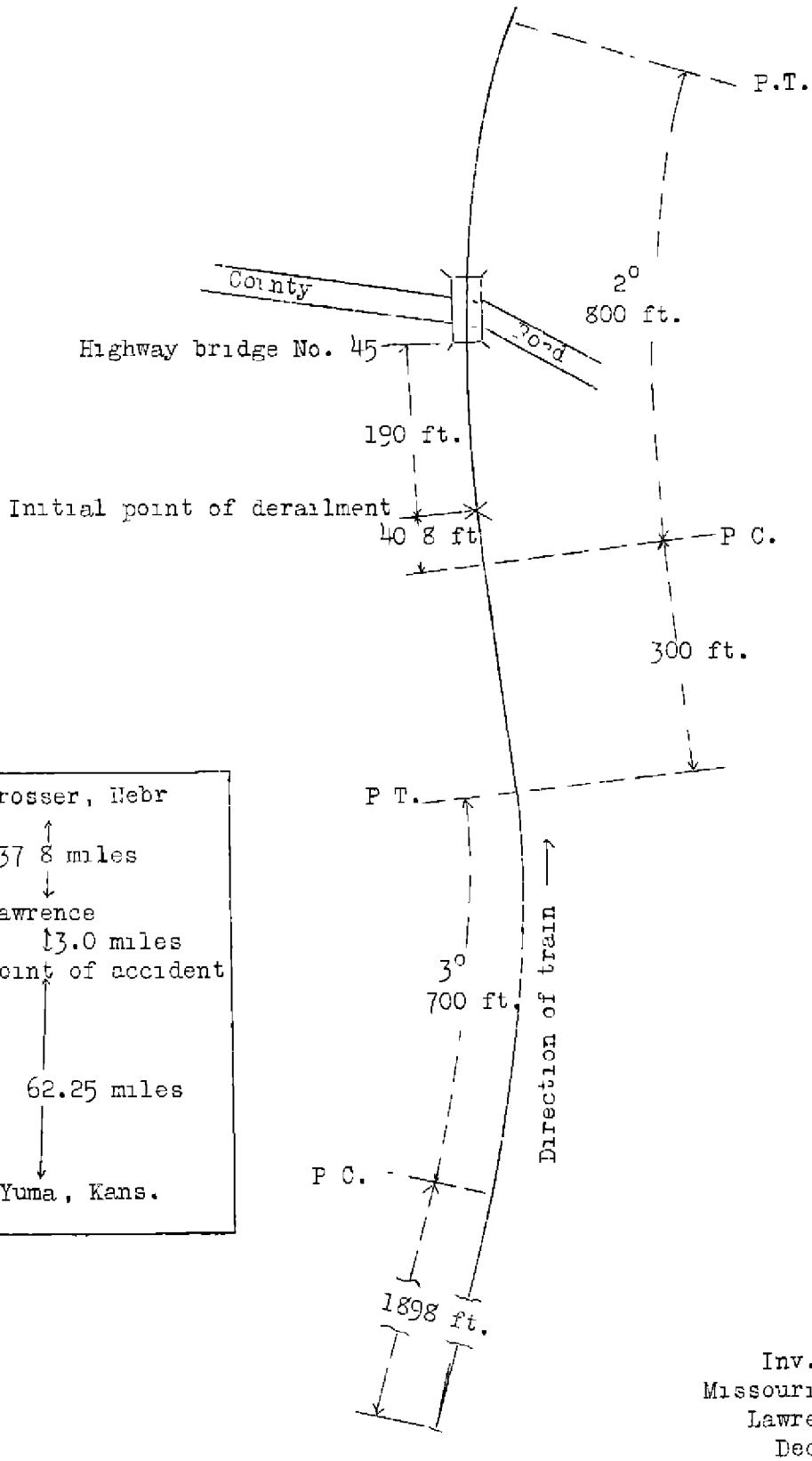
The track is laid with 56-pound rails, 30 feet in length, with an average of 17 ties to the rail-length, single-spiked, and ballasted with natural soil, clay-loam. Four-hole angle bars are used. It had been raining and snowing off and on for several days prior to the accident, and while it was not raining at the time of the accident, yet the roadbed was very soft.

The weather was foggy at the time of the accident, which occurred about 1.15 p.m.

Description

Westbound mixed train extra 2360 consisted of 2 freight cars, 1 baggage car, and 1 coach being used as a caboose, hauled by engine 2360, of the 4-6-0 type, and was in





Inv. No. 1742
Missouri Pacific R R.,
Lawrence, Nebr.
Dec. 10, 1931

charge of Conductor Donigan and Engineman Bergin. This train left Mt Clare, 9 08 miles east of Lawrence, at 12.55 p.m., according to the train sheet, and was approaching Lawrence at a speed estimated to have beer about 20 miles per hour when the coach was derailed on account of a broken rail.

The coach was derailed at a point 190 feet east of highway bridge No. 45, and continued on until it reached the middle of the bridge before it turned over to the left and came to rest on the ground bottom up, in line with the track and west of the county road, with its rear end 67 feet west of the east end of the bridge The coach caught fire from an overturned stove in the forward end and was consumed. The employees killed were the conductor and a brakeman, and the employee injured was the flagman

Summary of evidence

Engineman Bergin stated that approaching Lawrence the train was drifting down the grade at a speed of about 20 miles per hour, as the engine passed over the place where the initial point of derailment occurred, he felt a slight lurch, although nothing out of the ordinary, and as the engine was passing over the bridge he felt a resistance or pull on the train. On looking back he saw that the coach was derailed; he immediately applied the air brakes in emergency and about this time the car fell off the bridge, the engine and first three cars continuing on the track and stopping about one and one-half car-lengths beyond where the coach broke away. The air-brakes had been tested prior to starting the trip and worked properly en route, and he noticed nothing unusual as to the manner in which the train handled After the accident he went back and assisted the train crew in the coach, but made no examination of the track or roadbed. Statements of Fireman Gorrell were similar to those of Engineman Bergin.

Section Foreman Harvey stated that he passed over the track on a motor car about three and one-half hours prior to the occurrence of the accident, but noticed nothing unusual with respect to track conditions. He arrived at the scene of the accident about 45 minutes after its occurrence, and his examination of the track disclosed that the accident was caused by a broken rail, the short piece of rail at its leaving end had worked inward and there were marks where a flange had rolled up on to the rail. Temporary repairs were made by splicing the broken rail with angle bars and shifting a tie under the rail. Section Foreman Harvey had not walked over the track in the vicinity of the point of accident recently in order to

determine the condition of the ties, only inspecting them from the motor car, and he could not say whether there were any broken ties, while the motor car was not heavy enough to depress the track and disclose whether the track was churning. He did not know of any ties being center-bound, and said the roadbed was wet, but not soft. Since the accident he removed about 10 ties east of the point of derailment, these ties being soft, some checked, and others decayed, so that they would not hold the gauge. He said that when the track is found to be out of gauge, it is drawn in by pulling the spikes on both sides of the rail, plugging the spike holes, and regauging the rails, some of the ties in the immediate vicinity of the point of accident were pretty well plugged in this manner, and there were one or two ties that had a second plug driven next to the outside of the spike in order to hold it. The section assigned to Section Foreman Harvey is 11 miles in length; at the time of the accident he had two laborers assisting him, and the records indicatedthat during the past two years he had had two laborers about half the time and one laborer practically all the rest of the time.

Roadmaster Mathews stated that he passed over this section of track on eastbound train No. 690 about four hours prior to the occurrence of the accident, but noticed nothing unusual at that time He arrived at the scene of the accident about 3 a.m. December 11, and his examination of the track disclosed the broken rail, which was still in the track and on the outside of the curve, that evidently caused the accident. There were no marks to indicate dragging equipment, and the first tie to be marked was the fourth or fifth tie beyond the break. The track conditions were fairly good, with the gauge correct at the point of accident and the ties generally in fair condition, although once in a while broken ties would be found on the curve east of the point of accident He saw no evidence of churning at the ends of the ties, or sagging track, due to wet weather. Work of renewing ties and gauging the track had been performed within the week prior to the accident, and he also stated that no trouble was experienced in maintaining cross levels, surface or alinement. Roadmaster Mathews did not know definitely what caused the rail to break.

Car Inspector Vincent stated that he tested the air brakes on extra 2380 prior to the trip and that they worked properly. He arrived at the scene of the accident about 3. a.m December 11, and at that time he examined the debris of the burned coach, the angle cocks and cut out cock were in proper position, the wheel flanges were in good condition, and the foundation brake rigging intact. In his opinion the accident was due to a broken rail, the

break being clean and fresh, and he thought that the forward truck of the coach was the first to be derailed.

Division Engineer Bush gauged the track east of the point of accident on the day after its occurrence and it measured from 4 feet 8½ inches to 4 feet 9 inches, the superelevation of the outside rail of the curve was 2 inches

Examination of the track for a distance of approximately 1,000 feet east of the point of derailment disclosed it to be in poor condition. In the first 14 rail-lengths, 10 new ties had replaced old ones the day after the accident, in this same distance there were 19 ties with the ends broken and splintered and not sound enough to hold the spikes securely. The clay-loam ballast covered the ties in the center between the rails and on account of the fact that the ground was frozen at the time of this examination, it was not possible to ascertain the true condition in the center. There were numerous places where the ends of the ties were unsupported, caused by the ties churning during the previous wet weather, leaving them centerbound. There were also many places where the track had been pulled back into gauge by removing spikes, plugging the holes with wooden pins and redriving the spikes, at one place the tie was in such condition that a second wooden plug had been driven into the tie back of the spike in order to hold the spike in place. The track also was uneven as to level and alinement and measurements taken to ascertain the amount of sag at the ends of some of the unsupported ties, as a train passed slowly by, at which time the ground was frozen, showed the amount of sag to vary from 1 to 2½ inches.

The rail in this section of track was rolled by the Western Steel Company in August, 1887, and while there was no definite record as to when it was laid, the officials were of the opinion that this took place when the track was built in the fall of 1887 or early in the year of 1888. The rail broke at a point 5 feet 4½ inches from the leaving end; the fracture was a new clean break, extending diagonally upward and eastward, so that when it passed through the head of the rail it was 1 1/8 inches east of its origin. This left the rail immediately east of the point of fracture free to settle under the weight of a car, and also to give way or bend to the left, toward the outside of the curve, permitting the wheel flanges to strike the head of the leaving end of the rail; this latter portion of the broken rail was battered on the top of the head at the edge of the break, and two distinct flange marks were visible starting at the center of the head and extending diagonally westward for a distance of about 4 feet, where the wheels dropped off the rail on the outside West of this point, the track was torn out up to the bridge abutment.

Conclusions

This accident was caused by a broken rail.

The investigation clearly showed that a rail on the outside of the curve had broken in such a way as to permit the wheels to encounter the head of the leaving portion of the rail, mounting it and then traveling along on its running surface a short distance before dropping off on the outside. This was apparently a clean fracture, in an old 56-pound rail, and the reason for its failure was not definitely ascertained. The investigation developed, however that the track was not well maintained, even for branch-line traffic, the ties were only in fair condition, and the ballast was such that the rainy weather which had prevailed for some time had softened it very materially, resulting in churning out the ballast under the ends of the ties to such an extent that they would sag from 1 to 3½ inches under a moving train. Subsequent to the accident, other broken rails developed in this territory. With old light-weight rails in use, it is essential that the track be well maintained if strains are not to be placed on the rails which will be beyond their ability to withstand. In this particular case, while the cause for the breaking of the rail can not be definitely stated, it is believed that failure to maintain the track properly may well have been the underlying reason. This was not so much a question of inadequate inspection as it was of maintenance, and the development of such conditions should not be permitted to exist on any railroad.

All of the employees involved were experienced men, and at the time of the accident none of them had been on duty in violation of any of the provisions of the hours of service law.

Respectfully submitted,

W. P. BORLAND,

Director.