

INTERSTATE COMMERCE COMMISSION.

REPORT OF THE CHIEF OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE BOSTON & ALBANY RAILROAD NEAR WORCESTER, MASS., ON AUGUST 8, 1922.

September 7, 1922.

To the Commission:

On August 8, 1922, there was a derailment of a passenger train on the Boston & Albany Railroad near Worcester, Mass., resulting in the death of 2 employees, and the injury of 18 passengers, 1 employee on duty, and 5 employees off duty. This accident was investigated in conjunction with representatives of the Massachusetts Department of Public Utilities.

Location and method of operation.

This accident occurred on the Boston Division, extending between Boston and Springfield, Mass., a distance of 98.38 miles, in the vicinity of the point of accident the line is double-track, over which trains are operated by time-table, train orders and an automatic block-signal system. The initial point of derailment is about 7,500 feet east of Worcester passenger station, while the train came to rest in front of Tower 26, about 1,400 feet farther west. Approaching the point of derailment from the east there is a compound curve to the left 4,524 feet in length, varying from 1 degree 44 minutes to 4 degrees 10 minutes, followed by a tangent extending beyond Tower 26. The initial point of derailment was on the above curve at a point approximately 800 feet from its western end; at this point the track is in a rock cut about 22 feet in depth. The grade approaching the point of accident varies from 0.54 to 0.60 per cent ascending for westbound trains, the accident occurring just west of the center of a vertical curve 500 feet in length, following which the grade descends varying from 0.55 to 0.72 per cent. The track is laid with 105-pound steel rails, 33 feet in length, on untreated oak and yellow pine ties, about 20 ties to the rail-length, it is single-spiked, and tie plates and braces are used. The track is rock ballasted and is well maintained.

Description.

Westbound passenger train No. 27 consisted of engine 532, baggage car 894, which was a steel-underframe car, and smoking car 491 and coaches 457 and 540, which were of all-steel construction. This train was in charge

of Conductor Lee and Engineman McDonald. It departed from Boston at 1.15 p. m., on time, left North Grafton, the last reporting station, 5.2 miles east of Tower 26, at 2.19 p. m., one minute late, and was derailed while passing through the rock cut east of Tower 26 while running at a speed estimated to have been about 50 miles an hour. The weather was clear at the time of the accident, which occurred about 2.26 p. m.

From the initial point of derailment the train continued on for a distance of 1,379 feet, where it encountered a switch frog located 115 feet east of Tower 26. At this frog the entire engine truck, engine, and part of the cars were fully derailed and continued on plowing through the ballast and ties, the forward end of the train coming to rest about 300 feet west of the switch frog. At a point just west of Tower 26 the engine struck a telegraph pole about 14 inches in diameter, which raised the front end of the engine, causing it to turn around; it came to rest headed east, on its left side, to the north of the train. The tender came to rest in an upright position on the rails at the head end of the train, about 50 feet west of the engine, with both trucks missing. The baggage car came to rest on the roadbed parallel with and its east end resting against the engine. The smoking car also came to rest on the roadbed behind the baggage car and was tipped toward the north. The first coach was derailed, but remained upright while the rear coach was not derailed. The employees killed were the engineman and fireman.

Engine 532 is of the Pacific type, having a standard type 4-wheel engine truck. This type of truck consists of a swing center and heavy wrought-iron truck frame. The pedestals of the two journal boxes on each side of the truck are rigidly held in place by a heavy wrought-iron pedestal ~~brace~~ 1 x 7 inches. These braces are secured to each one of the pedestals by a 1-1/4 inch bolt. The combined brake beams and levers are of wrought iron and do not extend across the truck from wheel to wheel. They are connected on the inside with a yoke to the sleeve of the brake piston and on the outside to the brake head. The brake head, in addition to its connection with the brake lever, is also supported by a brake hanger 2 x 1-1/8 inches, which is secured to the truck frame. The brake levers are located above and on top of the pedestal brace which acts as a safety hanger for the brake lever.

Summary of evidence.

At a point about 7,500 feet east of Worcester passenger station, located in the cut where the curvature is 3 degrees and 30 minutes, were found many rocks and stones all of which were foreign to that locality, these stones varying in size from 5 to 60 pounds. One large solid stone was found resting upon the rail base and solid against the outside of the north or super-elevated rail. This stone bore indication of having been cleft by some

blunt object as a wheel flange, the cut portion being about 12 inches wide. Parts of the stone which had been crushed and separated from the main stone were found inside of the north rail. The portion of the stone remaining intact measured approximately 16 x 20 inches and was about 3-1/2 inches thick. In the immediate vicinity of this stone were found two other larger stones which bore indication of having been struck by a moving object, and within a distance of 250 feet were found 131 pieces of stone and rock of various sizes and weight all of which were foreign to that location. The first clearly defined mark of derailment was flange mark appearing on the head of the north rail at a point 270 feet west of the point where the large stone was found, and extending westward for eight feet, then dropping off on the north side. This mark followed along on the ties to the point where the switch frog was encountered just east of Tower 26.

Signal Maintainer Paine, who was a passenger on train No. 27, stated that when the train was passing through the cut he was riding in the baggage car looking out of the car door on the south side, just after the train had passed Plantation Street, he saw something which he thinks was a stone and appeared to be about the size of a man's head fly out from the train and strike the side of the cut, a few seconds later he saw sparks flying from under the engine the derailment followed, he estimated the speed of the train at the time of the accident to have been between 45 and 55 miles an hour.

Conductor Lee of train No. 27 stated that when the train entered the rock cut a running test of the brakes was made as was the custom of Engineman McDonald, when entering Worcester yard limits, but he felt no emergency application prior to the accident.

Flagman Biron stated that at the time of the accident he was riding in the rear end of the rear coach of the train, as soon as the train stopped he started back to flag, he went back about half a mile and looked along the track as he went; he found a spot on top of the rail where a stone had been crushed, but he found nothing to indicate that anything had been dragging or that anything other than the stone had been run over.

Road Foreman of Engines Morris stated that he made an examination of engine 532 after the accident, he found the engine truck all disconnected and the truck frame broken in two pieces, but all the parts were there. The flange of the leading wheel bore a batter mark about 2-1/2 inches long by about 1 inch deep, which in his opinion was a result of the derailment. He stated that the engine

came out of the shop after general repairs on April 19, 1922, and had made but 19,000 miles; the usual mileage between general repairs is about 80,000 miles.

Assistant Road Foreman of Engines King stated that he had inspected engine 532 before it started out on that trip, that he found nothing wrong and that the engine was in excellent condition. After the accident he found the engineer's brake valve in the emergency position.

Assistant Supervisor of Track Curtis stated that he made an examination of the track in the vicinity of the point of derailment at about 5.10 p. m. He found the track in good condition, the gauge not more than one quarter inch wide at the widest point; the elevation was 4 inches with a slight drop to 3-1/2 inches at some spots, but nothing which would be detrimental to traffic.

An examination of the engine after the accident disclosed that the wheels of the engine truck gauged properly and showed less than 1/16 inch tread wear. The driving wheels gauged properly except the leading pair which appeared to have been sprung between 2/16 and 3/16 of an inch, but this unquestionably was the result of the derailment. In other respects the engine appeared to be in good condition.

Conclusions.

This accident was caused by the engine of train No. 27 striking rocks on the track.

It is not known whether a piece of stone lying on the rail was the direct cause of the accident, but the evidence indicated that there were broken pieces of stone tossed about under the engine truck, some parts of which raised the engine truck wheels so that the flange would clear the north rail resulting in the derailment.

It is believed that the leading wheel of the engine truck was the first to be derailed and that it followed along on the ties until it came in contact with the switch frog. The damage done by the derailed wheels between the initial point of derailment and the switch frog, together with the fact that no brake application was made, indicated that in all probability Engineman McDonald was not aware of the derailment until the switch frog was reached.

There was no direct evidence as to how the rocks came upon the roadbed, although five boys ranging in age from 8 to 11 years of age are known to have been in the vicinity throwing stones over the embankment a short time previous to the derailment.

At the time of the accident the crew of train No. 27 had been on duty 6 hours and 2 minutes in the aggregate prior to which they had had over 24 hours off duty.

Respectfully submitted,

W. P. Borland,

Chief, Bureau of Safety.