INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE SOUTHERN RAILWAY NEAR LUMBER CITY, GA , ON DECEMBER 13, 1927.

January 30, 1928

To the Commission:

On December 13, 1927, there was a derailment of a freight train on the Southern Railway near Lumber City, Ga., resulting in the death of one employee and the injury of one employee.

Location and method of operation

This accident occurred on that part of the Atlanta Division of the Queen & Crescent District extending between Macon and Brunswick, Ga , a distance of 187 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 within yard limits, at a point 557 feet south of mile post 332-F, or about $2\frac{1}{2}$ miles north of Lumber City, approaching this point from the north there is a 1° curve to the left 1,562 feet in length, followed by 1,613 feet of tangent, the accident occuring on this tangent at a point 1,257 feet from its northern end The grade at the point of accident is level The track is laid with 75-pound rails, 33 feet in length, with 20 or 21 ties to the rail-length, single-spiked and ballasted with cinders to a depth of about 8 inches.

The weather was foggy and it was dark at the time of the accident, which occurred at about 6.28 a m.

Description

Southbound freight train No. 55 consisted of 33 cars and a caboose, hauled by engine 510, and was in charge of Conductor Munn and Engineman Harris This train left Helena, the last open office, 18.2 miles north of Lumber City, at 5.55 a.m , according to the train sheet, five minutes late, and was approaching Lumber City when it was derailed by a broken rail while traveling at a speed estimated to have been about 30 miles per hour.

Engine 510, its tender and the first three cars in the train were derailed but remained upright on the roadbed in line with the track, and were not seriously damaged. The fourth to the sixteenth cars, inclusive,

were scattered about at various angles with the track and were damaged considerably, four of them being destroyed. The forward truck of the seventeenth car was also derailed. The employee killed was the fireman, who either jumped or was thrown from the engine.

Summary of evidence

Engineman Harris stated that the engine truck was the first to be derailed and it felt as though the left engine-truck wheel had run off the end of a rail. The engine swayed to the left and the wheels on the left side dropped to the ties. On the right side of the track, however, the rail was turned over opposite the initial point of derailment and the wheel flanges on the right side of the engine ran on the web of the overturned west rail from that point to where the engine stopped. After the accident Engineman Harris took his torch and went back to see if he could ascertain the cause and saw the broken rail on the east side of the track; about 2 or 3 feet of the receiving end of the rail remained connected to the preceding rail by the angle bars. He found some of the fragments of the broken rail but could not find all of them and he said the breaks appeared to be new on all of the recovered fragments with the exception of the break near the receiving end of the rail, which seemed to have been an old fracture. Engineman Harris estimated the speed to have been about 30 miles per hour at the time of the accident. In his opinion a piece of the broken rail was missing from the track when his engine approached that point, although according to his statements the rays of the headlight of his engine did not reveal that there was anything wrong.

Head Brakeman McClelland stated that he saw the broken piece of the receiving end of the rail that remained connected to the adjoining rail by the angle bars and that the metal indicated it was an old fracture. He estimated the speed to have been between 28 and 30 miles per hour at the time of the accident and said that it felt just like the engine dropped off the end of a rail.

Conductor Munn was proceeding over the top of the train toward the engine and was riding in an empty low-side steel gondola car, the eighth car in the train, at the time of the accident. The track rode well and the first intimation he had of anything wrong was when he felt the air brakes apply in emergency, at which time the speed was between 30 and 33 miles per hour; he walked to the

west side of the car, looked ahead and saw the cars leaving the track. Conductor Munn sustained injuries as a result of the accident and therefore did not examine the broken rail. Flagman Kimbrew was riding in the cupola of the caboose at the time of the accident and his statements brought out nothing additional of importance.

Section Foreman Glover arrived at the scene of the accident about an hour after its occurrence and Track Supervisor Murphy arrived shortly afterwards. They saw various pieces of the broken rail and after the wreck train arrived the track supervisor removed from the track that piece of the broken rail which was connected to the adjoining rail by the angle bars; about 12 or 14 inches of the broken rail could not be found. The rail on the west side of the track began to overturn at a point about 30 feet beyond where the engine first derailed on the east side of the track. Examination of the track north of the point of accident disclosed it to be in good condition and there were no indications of dragging equipment. While some spike heads had worked up from the base of the rail about one-fourth or one-half inch, there were no spikes loose enough to be withdrawn from the ties by hand. Section Foreman Glover said he inspected the track where the accident occurred, on a motor car, at about 4.40 p.m. the day prior to the accident. He stopped in the immediate vicinity of the point where the rail broke, between two curves, and listened for a train, but noticed nothing wrong with track conditions at that time. Track Supervisor Murphy rode over the track where the accident occurred on northbound passenger train No. 8, at about 1.30 p.m., checking switch lights and listening for broken rails, but he said he heard nothing that sounded like a broken rail. Track Supervisor Murphy was of the opinion that the rail broke at a transverse fissure, one of which was located at the south end of the receiving portion of the rail which remained in the track. South of this broken rail there were some other rails broken as a result of the accident.

Roadmaster Bradley arrived at the scene of the accident about nine hours after its occurrence. His examination of the fragments of the broken rail disclosed that the rail broke as a result of a transverse fissure; there were two transverse fissures in the broken rail that caused the accident, and one transverse fissure in one of the other broken rails. Roadmaster Bradley said that very few transverse fissures have been displayed in the 75-pound rails. His inspection of the track north of the point of accident disclosed the ties, surface, alinement and gauge to be in good condition. Some of the ties were rail cut, however, and there were also spikes that had worked upward to some extent.

Road Foreman of Engines Pruitt inspected engine 510 at Lumber City on the afternoon of the day of the accident but found no defect that would have caused the derailment.

Southbound passenger train No. 7 was the last train to pass prior to the accident. It consisted of 11 cars and passed about three hours before the accident occurred. Members of the crew, and Trainmaster Lewis, who was riding on the engine, noticed nothing unusual as to track conditions. Trainmaster Lewis said that he had ridden engines when they passed over broken rails, and that under such circumstances it causes a slapping sound. About three hours after the accident he looked at the fragments of the broken rail involved and saw the transverse fissures.

Careful inspection of the track and engine failed to disclose anything that would have caused the accident. Many of the cypress ties in the vicinity of the point of accident were badly rail-cut, some being cut to a depth of about 2 inches, and a considerable number of spike heads did not come in contact with the bases of the rails, being 1 inch or more above the rails. All spikes, however, were solid in the ties and none could be pulled out by hand. With these exceptions the maintenance and condition of the track were good.

The rail which was the first to break was a Carnegie rail, heat No. 921, rolled in November,1903, and laid in the track in March, 1904, having been in continuous service at the point of derailment for 23 years and 9 months. The rail apparently broke into five pieces, all of which were recovered except one portion measuring 12 3/4 inches in length. The first break occurred 3 feet $3\frac{1}{2}$ inches from the receiving end, which remained connected to the preceding rail by the angle bars. The transverse fissure at this point was located on the gauge side of the head of the rail; it was oval-shaped, 1/2 inch in depth and 1 inch in width, and the top of the fissure was 1/4 inch below the running surface of the rail. The second broken piece of rail was 3 feet 2 inches long. The third piece was 3 feet $8\frac{1}{2}$ inches long; at the leaving end of this broken piece there was another oval-shaped transverse fissure, also on the gauge side of the head of the rail, 7/8 inch in depth and $1\frac{1}{2}$ inch in width, with the top of the fissure $\frac{1}{4}$ inch below the running surface of the rail. This third piece was followed by the missing portion, 12 3/4 inches in length, and then by the fifth

piece, comprising 21 feet 9¼ inches of the leaving end of the rail.

Conclusions

This accident was caused by a broken rail.

The cause of the fracture of the rail which resulted in the present derailment was specifically the presence of a transverse fissure. Two transverse fissures were displayed at the time of the accident.

Fractures of this type are being displayed in numbers in the tracks of different railroads. They are of interior origins, and from the manner of their development, signify progressive fractures occurring under track conditions.

Some rails are affected by shrinkage cracks, located along the middle of the section of the head, and also at the junction of the head and the base. Some engineers regard these shrinkage cracks or shattered zones of the head as the essential precursors in the formation of a transverse fissure.

The rail which caused the present accident and two other rails were examined for the structural state of the steel in the central parts of the heads; along those elements in which transverse fissures are found.

The rails thus examined were the
75-lb Carnegie rail of the present accident, rolled 1903
100-lb rail, Tenn. C.I.& Ry. Co. rolled 1923, and
100-lb rail, Tenn. C.I.& Ry. Co., rolled 1927,

each of which displayed a transverse fissure. The 75-lb Carnegie rail displayed a fissure of the ordinary type. The 100-lb. 1923 rail had a compound transverse fissure, that is, one which had its origin at a longitudinal seam; the 100-lb 1927 rail displayed a transverse fissure with a nucleus of unusual size.

The heads of these rails were planed off to the depth of the nuclei of the transverse fissures, and then pickled in hot hydrochloric acid. They displayed only longitudinal seaminess. There were no indications of

shattered zones along the central parts of the heads. These results were in harmony with other tests, in which no shattered zones have been found in transverse fissured rails, from which it would be inferred that shattered zones, whatever their influence may be are not indispensable in the display of this type of fracture.

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.