

INTERSTATE COMMERCE COMMISSION  
WASHINGTON

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INVESTIGATION NO. 2794  
THE LOUISVILLE & NASHVILLE RAILROAD COMPANY  
REPORT IN RE ACCIDENT  
NEAR KEELING, TENN., ON  
APRIL 27, 1944

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SUMMARY

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Railroad: Louisville & Nashville  
Date: April 27, 1944  
Location: Keeling, Tenn.  
Kind of accident: Derailment  
Train involved: Passenger  
Train number: 198  
Engine number: 281  
Consist: 7 cars  
Estimated speed: 60 m. p. h.  
Operation: Timetable and train orders  
Track: Single; 2°08' curve;  
vertical curve  
Weather: Cloudy  
Time: 9:01 a. m.  
Casualties: 2 killed; 38 injured  
Cause: Combination of flange wear on  
gage side of high rail of  
curve and irregularities in  
alinement, surface and gage  
of track

INTERSTATE COMMERCE COMMISSION

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INVESTIGATION NO. 2794

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION REPORTS  
UNDER THE ACCIDENT REPORTS ACT OF MAY 6, 1910.

THE LOUISVILLE & NASHVILLE RAILROAD COMPANY

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June 5, 1944.

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Accident near Keeling, Tenn., on April 27, 1944, caused by a combination of flange wear on gage side of high rail of curve and irregularities in alinement, surface and gage of track.

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REPORT OF THE COMMISSION<sup>1</sup>

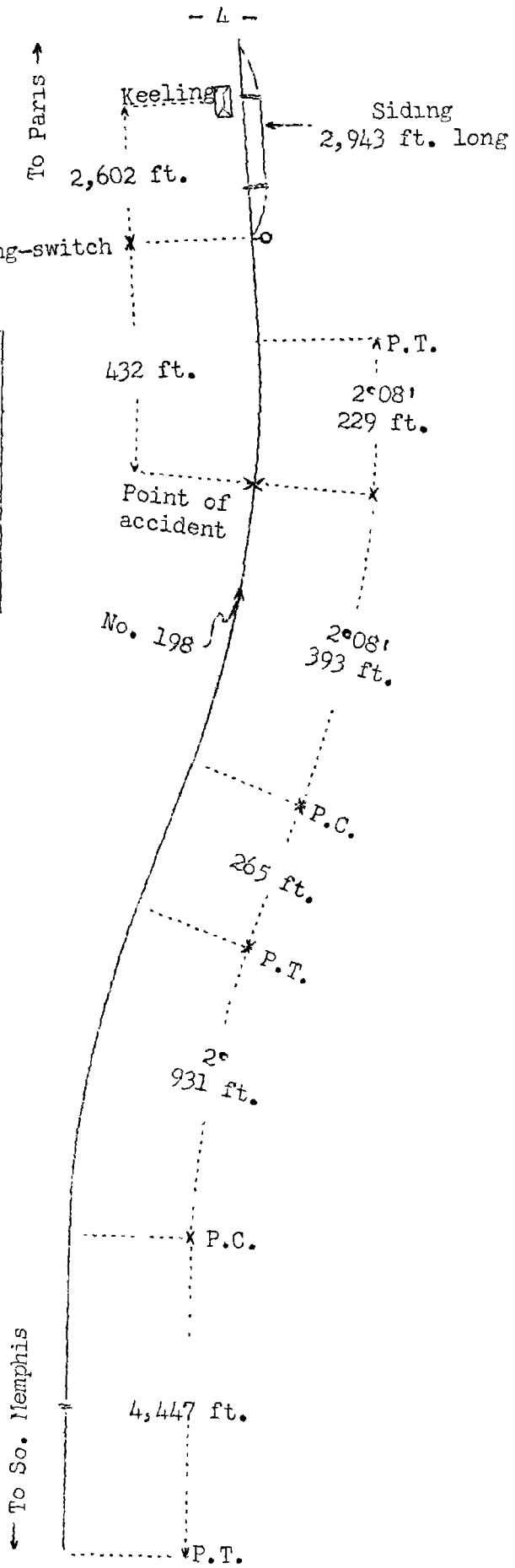
PATTERSON, Chairman:

On April 27, 1944, there was a derailment of a passenger train on the Louisville & Nashville Railroad near Keeling, Tenn., which resulted in the death of 2 train-service employees, and the injury of 29 passengers, 1 railway-mail clerk, 6 dining-car employees and 2 train-service employees.

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<sup>1</sup>Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Chairman Patterson for consideration and disposition.

- Paris, Tenn.  
90.30 mi.
- Keeling  
0.57 mi.
- ✕ Point of accident  
3.52 mi.
- Mason  
38.03 mi.
- So. Memphis, Tenn



Inv. No. 2794  
 Louisville & Nashville Railroad  
 Keeling, Tenn.  
 April 27, 1944

Location of Accident and Method of Operation

This accident occurred on that part of the Louisville Division extending northward from So. Memphis to Paris, Tenn., 132.42 miles. In the vicinity of the point of accident this was a single-track line over which trains were operated by timetable and train orders. There was no block system in use. The accident occurred 41.55 miles north of So. Memphis, at a point 0.57 mile south of the station at Keeling. From the south there were, in succession, a tangent 4,447 feet in length, a 2° curve to the right 931 feet, a tangent 265 feet and a 2°08' curve to the left 393 feet to the point of accident and 229 feet beyond. The grade for north-bound trains was, successively, 0.486 percent ascending 3,500 feet, 0.368 percent ascending 800 feet, then there was a vertical curve 25 feet to the point of accident and 275 feet beyond.

The track structure consisted of 90-pound rail, 33 feet in length, laid in 1915 on 18 treated ties to the rail length. It was fully tieplated, single-spiked and was ballasted with slag to a depth of 12 inches. The maximum superelevation on the curve was 4-1/2 inches and the gage varied between 4 feet 8-1/4 inches and 4 feet 8-3/4 inches. At the point of accident the superelevation was 4-1/2 inches and the gage was 4 feet 8-3/4 inches. The south switch of a siding 2,943 feet long, which paralleled the main track on the east, was 2,602 feet south of the station at Keeling. Entry to the siding at the south switch was made through a No. 10 turnout.

The maximum authorized speed for the train involved was 70 miles per hour.

Description of Accident

No. 198, a north-bound first-class passenger train, consisted of engine 281, of the 4-6-2 type, one passenger-baggage car, four coaches, one dining car and one Pullman sleeping car, in the order named. The fourth and fifth cars were of steel-underframe construction and the remainder were of all-steel construction. This train passed Mason, 4.09 miles south of Keeling and the last open office, at 8:57 a. m., on time, and while it was moving at an estimated speed of 60 miles per hour the engine and the first 6 cars were derailed.

The rear wheels of the engine truck were derailed to the right at a point 432 feet south of the south siding-switch, and continued in line with the track to the frog of the switch, where the general derailment occurred. The engine stopped on

its left side, with the front end about 365 feet north of the south siding-switch and about 25 feet east of the siding. The cab and the engine truck were demolished, and the engine was otherwise badly damaged. The tender became detached from the engine and stopped, considerably damaged, upright, across the main track and about 75 feet north of the engine. The first five cars stopped practically upright and in various positions across the track and west of it. The front truck of the sixth car was derailed. The first and second cars were considerably damaged, and the third, fourth and fifth cars were slightly damaged.

It was cloudy at the time of the accident, which occurred about 9:01 a. m.

The engineer and the fireman were killed. The conductor and the assistant conductor were injured.

The total weight of engine 281 in working order was 284,000 pounds. The diameters of the engine-truck wheels, driving wheels and trailer-truck wheels were, respectively, 33 inches, 73 inches and 43 inches. The tender was equipped with four-wheel trucks. The rigid wheelbase of the engine was 13 feet long, and the total length of the engine and tender was 81 feet 3-5/8 inches. The center of gravity was about 72 inches above the top of the rails. Examination after the accident disclosed no defective condition of the engine. The flanges of the front engine-truck wheels were slightly worn, but the flanges of the rear wheels were of full contour.

#### Discussion

No. 198 was moving on a 2°08' curve to the left at an estimated speed of 60 miles per hour, in territory where the maximum authorized speed was 70 miles per hour, when the rear engine-truck wheels became derailed. There was no defective condition of the engine prior to the accident, and there was no indication of dragging equipment or of any obstruction having been on the track. The brakes had been tested and had functioned properly en route. As the train was approaching the point where the accident occurred the members of the train crew were in various locations throughout the cars of the train. The cars had been riding smoothly, and the first these employees knew of anything being wrong was when they observed a vibrating action of the cars throughout a distance of about 400 feet immediately south of the south siding-switch, then the general derailment occurred at the switch. It could not be determined when the enginemen first became aware of anything being wrong, as they were killed in the accident.

Examination of the track disclosed flange marks on the ties outside the high rail and inside the low rail of the curve beginning at a point 229 feet south of the north end of the curve and extending northward 432 feet to the frog of the south siding-switch. From this point northward the track was torn up to the point where the engine stopped.

The investigation disclosed that on April 20, 1944, a track car, designed to record automatically irregularities in the alinement, cross-level and superelevation of the track, was operated over the track in the vicinity of the point where the accident occurred. An analysis of the track-car record disclosed numerous irregularities throughout 1 mile immediately south of the point of derailment. The four rail joints on the low side of the curve immediately south of this point varied from  $3/8$  to  $1/2$  inch low. The alinement varied from  $3^{\circ}$  to  $1^{\circ}30'$  and then to  $2^{\circ}30'$  within a distance of 40 feet just south of the point of derailment. Although the engineer in charge of the test car marked 38 irregularities, as indicated on the tape, for corrections to be made in the surface, alinement and cross-level of the mile of track immediately south of the point of derailment, no track repairs were made in this territory between the time of the test and the time of the accident. After the accident, examination disclosed that the gage side of the high rail of the curve at the point of derailment was worn between  $3/8$  and  $1/2$  inch. The angle of wear closely coincided with the shape of a flange of full contour. Throughout a distance of 93 feet immediately south of the point of derailment the gage varied between 4 feet  $8-1/4$  inches and 4 feet  $8-3/4$  inches. In addition, on several ties just south of the point in question there were indications that the base of the rail had been moving laterally under moving trains from  $1/8$  to  $1/4$  inch.

The marks on the track structure, and marks on the flange and inner side of the rear engine-truck wheels indicated that these wheels were the first to become derailed. The equilibrium speed for the engine on the curve involved was approximately 60 miles per hour, and the evidence indicated that the train was moving at that speed when the rear engine-truck wheels became derailed. The engine had passed from a curve to the right to a tangent 265 feet long and thence to a curve to the left, and had moved 393 feet on the latter curve when the derailment occurred. These conditions would tend to cause the engine to roll somewhat. The engine was moving at equilibrium speed on track having irregularities in alinement, surface and gage, and the right rear engine-truck wheel had a flange of full contour which offered little resistance in preventing the wheel

from moving laterally across the head of the curve-worn rail. The engine apparently pivoted and rolled laterally enough for this wheel to be forced suddenly across the high rail.

Cause

It is found that this accident was caused by a combination of flange wear on the gage side of the high rail of the curve and irregularities in alinement, surface and gage of the track.

Dated at Washington, D. C., this fifth day of June, 1944.

By the Commission, Chairman Patterson.

(SEAL)

W. P. BARTEL,  
Secretary.