

INTERSTATE COMMERCE COMMISSION
WASHINGTON

INVESTIGATION NO. 2498
THE READING COMPANY
REPORT IN RE ACCIDENT
AT MANAYUNK, PA., ON
APRIL 26, 1941

- 2 -

SUMMARY

Railroad: Reading
Date: April 26, 1941
Location: Manayunk, Pa.
Kind of accident: Derailment
Train involved: Passenger
Train number: 35
Engine number: 602
Consist: 4 cars
Speed: 40-45 m. p. h.
Operation: Timetable, train orders and
automatic block-signal system
Track: Double; 3° curve to right;
vertical curve
Weather: Clear
Time: 6 p. m.
Casualties: 1 killed; 90 injured
Cause: Accident caused by boards being on
high rail of curve

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2498

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

THE READING COMPANY

June 10, 1941

Accident at Manayunk, Pa., on April 26, 1941, caused by
boards being on high rail of curve.

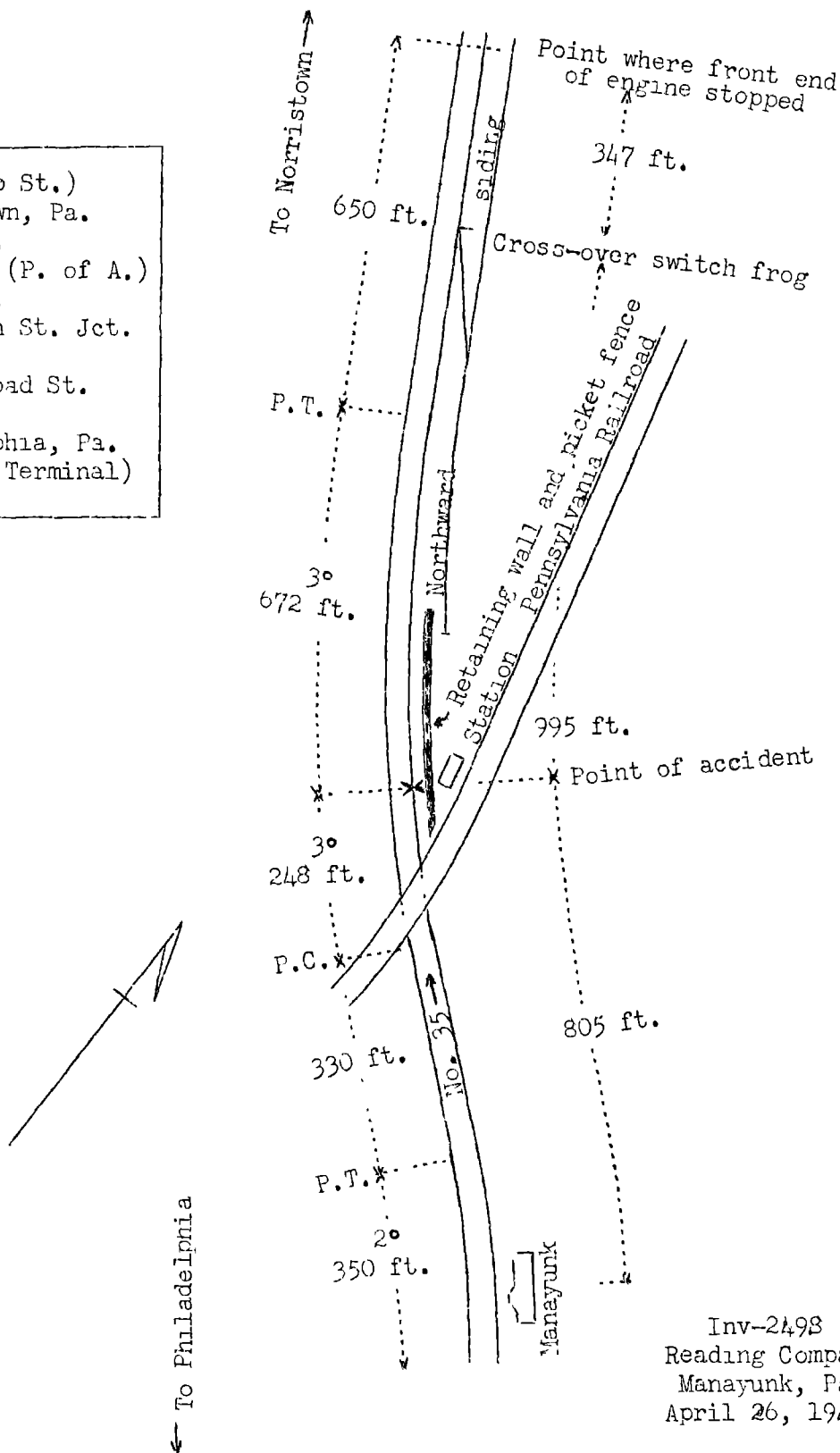
REPORT OF THE COMMISSION¹

PATTERSON, Commissioner:

On April 26, 1941, there was a derailment of a passenger train on the line of the Reading Company at Manayunk, Pa., which resulted in the death of 1 employee and the injury of 89 passengers and 1 employee. This accident was investigated in conjunction with the Pennsylvania State Public Utility Commission.

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

	(De kalb St.)
○	Norristown, Pa.
	9.7 mi.
X	Manayunk (P. of A.)
	4.0 mi.
○	Sixteenth St. Jct.
	0.6 mi.
○	North Broad St.
	2.9 mi.
○	Philadelphia, Pa.
	(Reading Terminal)



Inv-2498
Reading Company
Manayunk, Pa.
April 26, 1941

Location and Method of Operation

This accident occurred on that part of the Philadelphia Division designated as the Norristown Branch which extends between Sixteenth St. Jct., Philadelphia, and De Kalb Street, Norristown, Pa., a distance of 13.7 miles. In the vicinity of the point of accident this is a double-track line over which trains are operated by timetable, train orders and an automatic block-signal system. At a point 662-1/2 feet north of the station at Manayunk a double-track line of the Pennsylvania Railroad, hereinafter referred to as the Pennsylvania, crosses overhead the tracks of the Reading Company, hereinafter referred to as the Reading, at an angle of 58 degrees and at an elevation of 24 feet above the Reading tracks. At a point 142.5 feet north of the overhead crossing a station waiting-room and platform of the Pennsylvania are parallel to its tracks on the west, are 24 feet above the northward track of the Reading and 25 feet horizontally distant from it. The derailment occurred on the northward main track at a point 805 feet north of the Reading station at Manayunk and opposite the Pennsylvania station. The main-track frog of a trailing-point crossover between the northward main track and the northward siding is located 1,800 feet north of the Reading station. As the point of accident is approached from the south there are, in succession, a 2° curve to the left 350 feet in length, a tangent 330 feet, a 3° curve to the right 920 feet, and a tangent 660 feet. The accident occurred on the 3° curve at a point 248 feet north of its southern end. The grade for north-bound trains is 0.62 percent descending a distance of 2,100 feet, then there is a vertical curve 300 feet, which is followed successively by level track 888 feet and a 0.19 percent descending grade 225 feet. The accident occurred on the vertical curve at a point 88 feet north of its southern end.

The track structure consists of 130-pound rail, 39 feet in length, laid new in 1929 on an average of 22 treated oak ties to the rail length; it is fully tieplated, spiked with 2 spikes on the inside and 1 spike on the outside of the rails, and is provided with an average of 4 rail anchors per rail length; it is equipped with 4-hole continuous head-free angle bars, 24 inches in length, and is ballasted with crushed stone to a depth of 12 inches. At the point of accident the superelevation was 3-3/4 inches and the gage was 4 feet 8-1/2 inches.

In the vicinity of the point of accident the maximum authorized speed for the train involved is 50 miles per hour.

The weather was clear at the time of the accident, which occurred about 6 p. m.

Description

No. 35, a north-bound first-class passenger train, with Conductor Dunkelberger and Engineman Heltzinger in charge, consisted of engine 602, of the 4-6-0 type, two coaches, one combination car and one baggage car, in the order named; all cars were of steel construction. This train departed from Reading Terminal, Philadelphia, 7.5 miles south of Manayunk, at 5:45 p. m., according to statements of the crew, 2 minutes late, passed Manayunk at 5:59 p. m., according to the train sheet, 2 minutes late, and became derailed while it was moving at a speed estimated as 40 to 45 miles per hour.

The front pair of wheels of the engine truck were derailed to the left but continued in line with the track for 995 feet to the trailing-point crossover switch where the general derailment occurred. The engine and tender, remaining coupled, stopped on their right sides on the siding with the front end of the engine 1,342 feet north of the point of derailment. The right side of the main cab of the engine was crushed inward against the boiler and the fireman's shelter at the back-head was torn off. The first three cars were derailed to the right but remained coupled. The first car stopped against the rear of the tender, parallel to the northward main track, and leaned to the right at an angle of 75 degrees. The second and third cars stopped at an angle of 10 degrees to the main track and leaned to the right at a 45-degree angle. The front truck of the fourth car was derailed.

The employee killed was the engineman and the employee injured was the fireman.

Summary of Evidence

Fireman McElfactrick stated that at Reading Terminal a terminal air-brake test was made and the brakes functioned properly en route. As the train was approaching the point where the accident occurred he was located in the left gangway between the engine and the tender and the speed was about 40 miles per hour. The first he knew of anything being wrong was when the engine lurched severely after it passed under the Pennsylvania tracks. The fireman climbed up to the section of the right running-board back of the main cab. He could see the engineman standing in the cab; however, as the engine overturned almost immediately afterward, the fireman was unable to observe if any action was taken to stop the train. Soon after the accident occurred he proceeded back to the point of derailment and observed at a point a short distance north of the Pennsylvania overhead bridge several pieces of a board on the high rail of the curve; these pieces had been run over by wheels. Another board was lying east of the northward main track. In his opinion the derailment was caused by the engine-truck wheels being raised by the boards.

Conductor Dunkelberger stated that at Reading Terminal a terminal air-brake test was made, a running test was made as the train departed, the brakes were used to control the speed at various points en route and the brakes functioned properly. As his train was approaching the point where the accident occurred he was in the first car, it was riding smoothly, and the speed was between 40 and 45 miles per hour when the brakes became applied in emergency and immediately afterward the car became derailed. After the accident occurred he examined the track a short distance to the rear of his train but was unable to determine the cause of the accident. In his opinion, the engine becoming derailed thrust the track out of alignment and caused the derailment of the following units. He said that the weather was clear at the time of the accident, which occurred about 6 p. m.

The statement of Baggage-master Newman added nothing of importance.

Flagman Bickley stated that as his train was approaching the point where the accident occurred he was collecting fares in the second car when the air brakes became applied in emergency and immediately afterward the car became derailed. As he proceeded to the rear to provide flag protection, at a point just north of the Pennsylvania overhead bridge he observed several boards along the high rail. Some of the boards were splintered and had the appearance of having been run over.

Section Foreman Fiori stated that he arrived at the scene a few minutes after the accident occurred. He inspected the track and found 6 or 7 small boards about 140 feet north of the Pennsylvania overhead bridge; several were between the rails and others were outside the rails. One board was crushed into two portions; one portion lay between the rails and the other was outside the high rail. On the head of the high rail at the location of this broken board there were splinters of wood mashed flat on the head of the rail. Just north of this point a flange mark appeared on the head of the rail and extended throughout a distance of about 24 feet. Apparently the flange then dropped to the outside of the rail, marked the outside angle bar and dropped to the ties. For some distance northward from this point the ties were marked by flanges.

Superintendent Keene stated that the first mark of derailment was on the high rail of a 30° curve to the right at a point 805 feet north of the Reading station at Manayunk. A flange mark extended diagonally upward on the gage side of the high rail at a point 16 feet 4-1/2 inches north of its receiving end and crossed the head of the rail in a distance of 22 feet 7-1/2 inches, then dropped to the outside on the angle bar at the leaving end. On the second tie north of the joint there was a flange mark 7-1/4 inches inside the low rail. The flange marks contin-

ued outside the high rail and inside the low rail at uniform distances. The marks outside the high rail were on the edges of the tieplates. At the crossover between the siding and the northward main track the derailment became general and the ties were badly splintered. North of the crossover the track was torn out throughout a distance of 300 feet. The gage and super-elevation, which were taken at stations 31 feet apart, throughout a distance of 248 feet south of the point of derailment were as follows:

<u>POINT</u>	<u>GAGE</u>	<u>SUPERELEVATION</u>
<u>248</u>	4 feet 8-1/2 inches	0
217	4 feet 8-1/2 inches	1/2 inch
186	4 feet 8-3/4 inches	15/16 inch
155	4 feet 8-3/4 inches	1-1/2 inches
124	4 feet 8-3/4 inches	1-3/4 inches
93	4 feet 8-1/2 inches	1-3/4 inches
62	4 feet 8-1/2 inches	2-1/2 inches
31	4 feet 8-1/2 inches	3-1/4 inches
Point of derailment	4 feet 8-1/2 inches	3-3/4 inches

Lieutenant of Police Smith, of the Reading, stated that he arrived at the scene about 35 minutes after the accident occurred. He examined the track at the point of derailment and found wood fiber mashed on the head of the outside rail throughout a distance of 3 feet. The gage side of the high rail being abraded at this point indicated that a flange had climbed upward to the head of the high rail, then had crossed diagonally to a point about 22 feet farther north, and dropped outside. The wood on the track apparently was from the Pennsylvania station just above the Reading tracks.

Master Carpenter Walsh, of the Reading, inspected the boards involved and found that some of the pieces were flooring material and others were of pine 3/4 inch thick and 2-1/2 inches wide. The pine boards were used as trim around the outside of the Pennsylvania platform shelter. Some of this 3/4-inch lumber had been removed from the water table. Several pieces of old flooring had been removed and replaced by new flooring. One board 7 feet long, 3/4 inch thick and 2-1/2 inches wide at one end and tapering to a point at the other, was identified as one that had been removed from the water table. This identification was made in the presence of Interstate Commerce Commission inspectors and representatives of the Pennsylvania and the Reading.

Carpenter Troutman, of the Pennsylvania, stated that he assisted in repairing the Pennsylvania station at Manayunk. The repairs consisted of installing a window and new flooring, and removing portions of the water table. This work was completed about noon, April 26. During the time the repairs were being

made none of the refuse lumber fell to the Reading tracks. He said that all discarded lumber was given to nearby residents for firewood. He understood that it was contrary to the instructions of the division engineer to leave loose material lying near the scene of repair. He identified the boards recovered from the Reading tracks as boards that were discarded material from the Pennsylvania station.

Master Carpenter Lose, of the Pennsylvania, stated that instructions had been issued by the division engineer not to leave material lying around the scene of any repair work.

Car Inspectors Curtin and Kolbe, at Reading Terminal, stated that they conducted the terminal air-brake test of No. 35 before it departed. Each brake applied and released properly.

Engineman Reilly, of No. 49, the last train prior to No. 35 to pass over the point involved, stated that his train departed from Manayunk at 5:47 p. m. When his train passed the point where the accident later occurred the speed was about 20 miles per hour, it was daylight and the weather was clear. There was no unusual condition of the track and he did not see any boards on the track or near it.

Fireman Rotherham, of No. 49, practically corroborated the statement of Engineman Reilly.

Just prior to the occurrence of the accident, seven boys whose ages ranged from 9 to 14 were gathering firewood which consisted of discarded boards from the Pennsylvania station. Five boys threw the boards to the Reading tracks where two boys were loading them on a bicycle to haul away.

According to data furnished by the railroad, engine 602 is deckless, equipped with two cabs, and known as the "Mother Hubbard" type. The front cab is located on the boiler immediately in front of the firebox and the rear cab is attached to the back-head. The total weight of the engine is 216,640 pounds distributed as follows: Engine truck, 47,540 pounds; No. 1 pair of driving wheels, 52,730 pounds; No. 2 pair of driving wheels, 61,725 pounds; No. 3 pair of driving wheels, 54,545 pounds. The length of the rigid wheel base is 13 feet 6 inches, the length of the total wheel base is 25 feet 6 inches, and the total length of the engine and tender is 66 feet 1 inch. The tender is rectangular in shape and has two four-wheel trucks; its capacity is 8,000 gallons of water and 12.85 tons of coal. The gross weight of the tender is 162,000 pounds. The last monthly certificate was received April 3, 1941.

According to A. R. E. A. superelevation tables, the maximum safe speed on a 3° curve having a superelevation of 3-3/4 inches is about 68 miles per hour.

Observations of the Commission's Inspectors

The Commission's inspectors examined the track throughout a distance of 1 mile south of the point of derailment. There were no indications of dragging equipment or defective track. At the point of derailment there were splinters of wood lying in the ballast. They found the marks of derailment to be as previously described. The first pair of engine-truck wheels was the only part of the engine to be derailed until the engine encountered the crossover between the siding and the northward main track. They found no condition of the engine existing prior to the derailment that could have contributed to its cause. A piece of yellow pine board picked up from the Reading tracks matched a piece of board found under the Pennsylvania station.

Discussion

According to the evidence, No. 35 was moving at a speed of 40 or 45 miles per hour in territory where the maximum authorized speed was 50 miles per hour when the first pair of engine-truck wheels became derailed to the left on a 3° curve to the right, having a superelevation of 3-3/4 inches, at a point 805 feet north of the station at Manayunk. No other wheels were derailed until the engine reached a trailing-point crossover switch 995 feet beyond the point of derailment. According to A. R. E. A. superelevation tables, the maximum safe speed on this curve is about 68 miles per hour. The track was in good surface and alignment, the engine had been riding smoothly, and there was no indication of defective track or equipment.

Immediately after the occurrence of the accident, several boards were found at the point of derailment. Wood fiber was found throughout a distance of 3 feet on the head of the high rail of the track involved and in the ballast. One portion of a crushed board lay between the rails of the track involved and another portion lay outside the high rail. At the point where the wood fiber was found, a mark indicated that the flange of the left front engine-truck wheel had mounted the head of the high rail; it had then crossed diagonally to the outside of the rail within a distance of 22 feet 7-1/2 inches and dropped outside the high rail, and its companion wheel dropped inside the low rail. Apparently when the left engine-truck wheel struck one or more of the boards the flange of that wheel was raised high enough for the flange to move upon the head of the rail. The path of the flange mark indicated that the wheel moved in a tangential direction.

The boards involved were identified as boards that had been discarded during repair work on the Pennsylvania station, located about 24 feet above the track involved and about 25 feet horizontally distant from it. The repair work had been completed only a few hours before the accident occurred. The carpenters who made the repairs had been instructed not to leave material lying near the scene of repair work. They stated that they had followed these instructions in their work at this point by giving the discarded material to nearby residents. Nevertheless, just prior to the occurrence of the accident, seven boys were gathering firewood which consisted of discarded boards from the Pennsylvania station. Five boys threw boards down to the feeding tracks where two boys were loading them on a bicycle to haul away. The fireman did not see the obstruction on the track and apparently the engineman did not see it as he took no action to stop the train until after the engine-truck wheels became derailed.

Cause

It is found that this accident was caused by boards being on the high rail of a curve.

Dated at Washington, D. C., this tenth day of June, 1941.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,

Secretary.