

INTERSTATE COMMERCE COMMISSION

WASHINGTON

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REPORT OF THE DIRECTOR

BUREAU OF SAFETY

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ACCIDENT ON THE

PENNSYLVANIA RAILROAD

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RUSHVILLE, IND.

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APRIL 16, 1937

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INVESTIGATION NO. 2169

SUMMARY

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Inv-2169

Railroad: Pennsylvania  
Date: April 16, 1937  
Location: Rushville, Ind.  
Kind of accident: Derailment  
Train involved: Freight  
Train number: IS-20  
Engine number: 8271  
Consist: 7 cars, caboose  
Speed: 15-20 m.p.h.  
Track: 1° curve; 0.60 percent descending grade  
Weather: Clear  
Time: 1:27 p.m.  
Casualties: 1 killed; 1 injured.  
Cause: Poorly maintained track

May 17, 1937

To the Commission:

On April 16, 1937, there was a derailment of a freight train on the Pennsylvania Railroad near Rushville, Ind., which resulted in the death of one employee and the injury of one employee. This accident was investigated in conjunction with a representative of the Public Service Commission of Indiana.

#### Location and method of operation

This accident occurred on the Shelbyville Branch of the Indianapolis Division, extending between Columbus and Dublin, Jct., Ind., a distance of 62.1 miles; this is a single-track line over which trains are operated by timetable, train orders and a manual block-signal system. Timetable directions are used in this report. The accident occurred at a point approximately  $3\frac{1}{2}$  miles east of Rushville; approaching the point of accident from the west the track is tangent for a distance of 2 miles, then there is a  $20^\circ$  curve to the left 1,035 feet in length, tangent track 1,413 feet in length, followed by a  $10^\circ$  curve to the right 1,000 feet in length, the accident occurring on this curve at a point about 93 feet from its western end, at which point the track is on a 10-foot embankment. The grade for eastbound trains is 0.60 percent descending for a distance of 3,000 feet to the point of derailment, following which it is 0.42 percent descending.

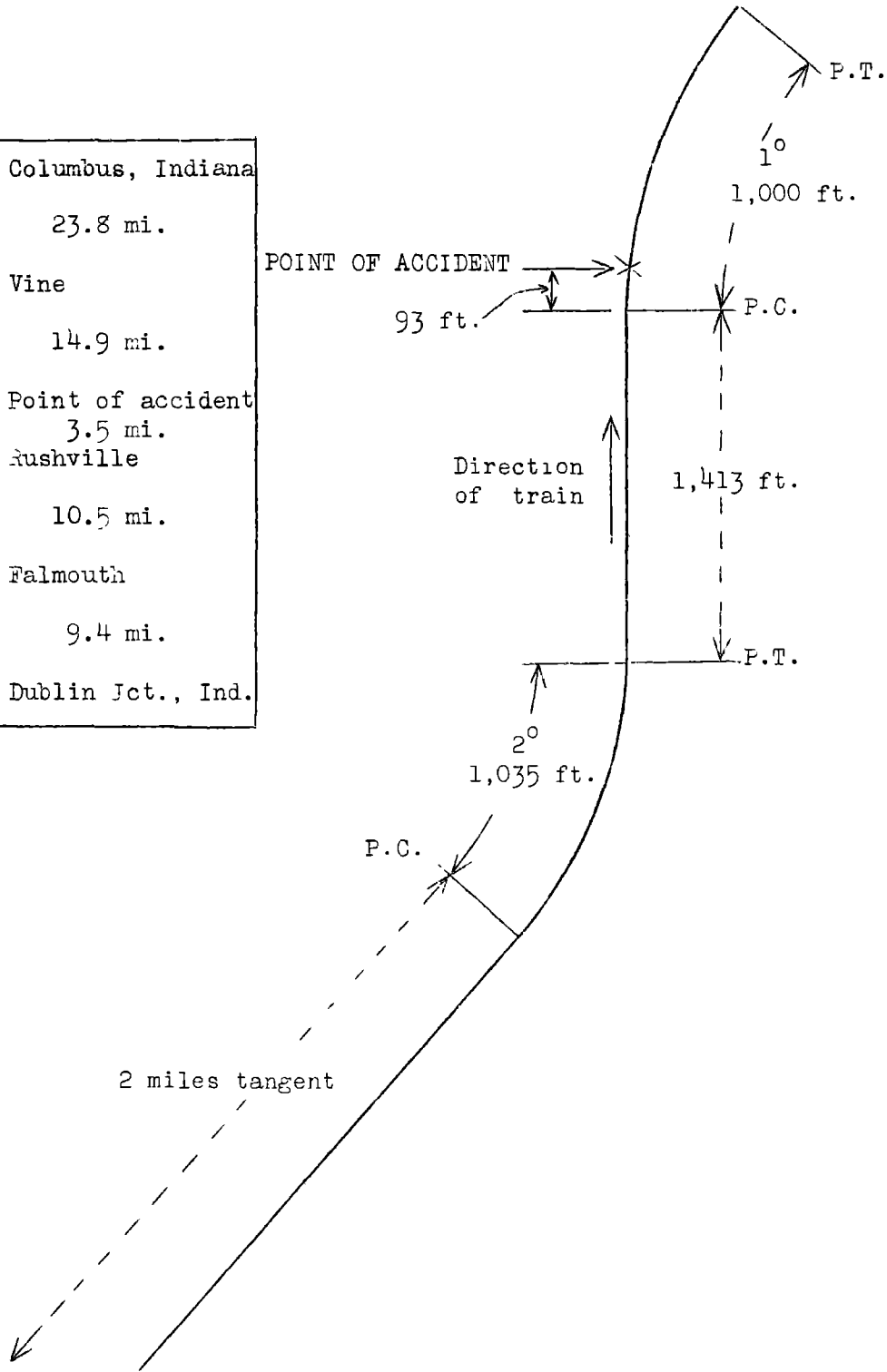
This track is laid with 85-pound used rail, 50 feet in length, laid in 1913, with an average of 16 ties to the rail length, partly tieplated on curves, single-spiked and ballasted with cinders; the track is poorly maintained. The speed of engines running backward is restricted to 25 miles per hour.

The weather was clear at the time of the accident, which occurred about 1:27 p.m.

#### Description

Train IS-20, an east-bound freight train, consisted at the time of the accident of 7 cars and a caboose, hauled by engine 8271 running backward, and was in charge of Conductor Newkirk and Engineman Davis. This train left Falmouth, its

o	Columbus, Indiana	
		23.8 mi.
o	Vine	
		14.9 mi.
X	Point of accident	
		3.5 mi.
o	Rushville	
		10.5 mi.
o	Falmouth	
		9.4 mi.
o	Dublin Jct., Ind.	



Inv. No. 2169  
Pennsylvania Railroad  
Rushville, Indiana  
April 16, 1937

initial station, 14 miles west of the point of accident, at 12:40 p.m., according to the train sheet, stopped at Rushville, where 5 cars were picked up, and departed about 1:05 p.m., according to the conductor's statement, and was derailed while traveling at a speed estimated to have been between 15 and 20 miles per hour.

The engine and tender remained coupled and were derailed to the right, stopping upside down at the foot of the embankment, 25 feet from the track, with the rear of the tender 260 feet east of the point of derailment. The first car was derailed to the right and stopped with its forward end resting on the pilot-beam of the engine and its rear end on the right rail; the second and third cars and the forward truck of the fourth car were derailed but remained upright and in line with the track. About 150 feet of track was demolished. The employee killed was the fireman, while the employee injured was the engineman.

#### Summary of evidence

Engineman Davis stated that he made a test of the train brakes before leaving Rushville and all brakes were operating properly; the brakes were not applied between that point and the point of accident. He did not observe any unusual rocking of the tender and the engine appeared to ride the same as on other trips. His first warning of the derailment was when the track appeared to go out from under the engine, at which time he estimated the speed of his train to be about 20 miles per hour. He could assign no cause for the derailment.

Conductor Newkirk, who was in the caboose, stated that the train departed from Rushville at 1:05 or 1:10 p.m. and that the speed was not more than 15 or 18 miles per hour from there to the point of accident. His first intimation of anything wrong was when he felt two or three impacts and the train stopped within about  $3\frac{1}{2}$  car lengths. He noticed nothing unusual in the movement of the caboose just prior to the derailment but said the track was exceedingly rough at all points en route. No application of the brakes was made between Rushville and the point of accident. After the derailment he examined the track and found wheel marks on the outside of the left rail; these marks appeared on the web of the rail for a short distance and then diverged to the ends of the ties which they followed for a few feet and disappeared at the point where the track was torn up; corresponding marks appeared inside the right rail. He did not examine any of the wheels. Flagman Towne, who was also in the caboose, said the speed was between 15 and 17 miles per hour; he did

not examine the track after the accident. It was his opinion that the derailment was not caused by excessive speed. Brakeman Smith stated that he had ridden engines over this territory and on account of rail joints being generally uneven, the tender would rock to such an extent that he considered it a dangerous condition; these rough spots were frequently reported to the supervisor or track foreman.

Trainmaster McDaniel examined the track after the accident and found no indication of dragging equipment; there were wheel marks on the left rail, immediately east of which the track was destroyed. He also examined all wheels but found nothing that would have caused the derailment. The engine involved was the usual type used on this branch and due to no facilities for turning engines after leaving Columbus, it is customary to run them in backward motion on the eastward trip.

Division Engineer Wood inspected the track and found a mark evidently made by a wheel passing over the left rail and drooping to the outside, the flange coming down on the base of the rail and traveling a few feet eastward on the ties from which point the track was destroyed; there were corresponding marks on the inside of the right rail. A few hours after the accident occurred and while cars were standing on the track he took the cross-level and gauge westward from where the track was broken, at intervals of 11 feet for a distance of 330 feet; the cross-level at the point where the wheel started to climb the rail was  $2 \frac{7}{8}$  inches, and 11 feet west thereof it was  $2 \frac{3}{4}$  inches, variations of from  $\frac{1}{8}$  to  $\frac{1}{4}$  inch per station, continued for a distance of 110 feet at which point a rail joint on the right rail was found to be 1 inch low. On the following day, when there were no cars on the track, cross-levels were taken on both the high and low rails; at a location 44 feet west of the point where the wheel mounted the rail there was a difference of  $\frac{7}{8}$  inch between the track when depressed under load and when not depressed. It was Division Engineer Wood's opinion that the tender wheels climbed the rail, but as the cross-levels and gauge were particularly good at this point, he could assign no reason for it.

General Foreman of Track Ruddick stated that he last rode over the track on April 7 and found no unusual track conditions. In examining the track a few hours after the accident in company with the section foreman, he found no condition that would have contributed to the derailment as he thought the track was in good condition for the authorized speed and the traffic it carried. Frequently in the past when riding engines he has observed the tender bouncing around somewhat

when backing on this line. No track work had been done in this locality for about a month, the last work being the renewal of some ties. He said trainmen reported unusually rough places in the track to him; it was his opinion that the tender became derailed to the left, turning the trucks crossways, which forced the engine to the right.

Track Foreman Kinnaman's statements concerning the wheel marks at the point of derailment agreed with those of the division engineer. The track foreman was last over the track at the point of derailment on the day the accident occurred and found no unusual track conditions; he had noticed engines backing up but had seen no excessive motion of the tenders and thought the track was safe for a speed of 30 miles per hour. Ties were renewed in the immediate vicinity of the point of accident 3 or 4 weeks prior to the time of the derailment and in addition to this, an attempt is made to keep all spikes topped down. He has 30 miles of main track to maintain with a force of 2 helpers. There are from 6 to 10 good spike-holding ties per rail and the track is in about the same condition it was at the time he took charge 5 years ago.

Assistant Enginehouse Foreman Von Berg inspected the engine and tender at the scene of the accident and found the flanges to be of full contour, the back-to-back measurements of the tender wheels within a tolerance of 53 to 53 5/8 inches, the side-bearing clearance of both tender trucks within the maximum tolerance and the male center-casting fitted into the female casting 1/4 inches in depth; he found no defect that would have contributed to or caused the derailment. The tender was of the rectangular shape and equipped with a steel under-frame and pedestal type truck-frames with elliptical springs; both pair of rear truck-wheels were applied new on April 9, 1937.

Master Mechanic Sheedy checked the side-bearing clearance of the tender and found it to be correct; in addition, he checked the lateral on the engine truck and drivers and found the following:

Engine truck	3/8"	lateral
No. 1 pair of drivers	13/32"	"
No. 2 pair of drivers	15/32"	"
No. 3 pair of drivers	15/32"	"
No. 4 pair of drivers	15/32"	"

He did not think the water surging in the tank, at the speed the train was reported to have been traveling, would exert enough pressure to cause the wheel to climb the rail.

Road Foreman of Engines Warren, on arrival at the scene of the accident, found the automatic brake-valve in running position and the independent brake-valve on lap, while the throttle was open three notches.

Car Foreman Ruck inspected the engine and tender after the accident and found no defect that would have caused the derailment.

The Commission's inspectors examined the track on April 18 at which time the derailed cars and engine had been removed and the track repaired. They found the first flange mark on the ball of the left rail 95 feet east of the west end of the curve on which the accident occurred; this mark continued diagonally across the ball of the rail for a distance of 17 feet and then appeared on the tieplate of the following tie,  $1\frac{1}{2}$  inches outside of the base of the left rail, then continued diagonally across the next 5 ties, the last mark being 10 inches from the base of the rail and 13 feet east of the point where the wheel dropped off the rail; corresponding flange marks appeared inside of the right rail. Beyond the last flange mark, the track had been destroyed for a distance of about 150 feet. Many of the spike-heads were from  $\frac{1}{2}$  to 1 inch above the rail base and many were more than  $\frac{1}{2}$  inch from the rail, only 30 to 40 percent being firmly spiked. The track was in better condition on the curve, being about 50 percent tieplated, and not more than 10 percent of the ties were bad, but the tangent track immediately west of the curve was in poor condition. During a later inspection made on April 20, it was found that repairs had been made on the tangent track west of the point of accident. Within a distance of 18 rail-lengths, 10 joints had been raised and at a point approximately 1,050 feet west of the point of derailment, 6 ties had been renewed at one rail joint, the removed ties being badly decayed. A train was observed moving over the track at a speed of 10 miles per hour and the track became depressed as much as 2 inches under the weight. The rail, which appeared considerably worn, was rolled in 1901 and after being used at other locations, was laid on this branch in 1913.

Engine 8271, a 2-3-0 type locomotive, has a driving wheel-base of 17 feet  $\frac{1}{2}$  inch while the total wheel-base of the engine and tender is 62 feet 4  $\frac{7}{8}$  inches, total weight of engine and tender is approximately 422,500 pounds. The tender has a capacity of about 7,100 gallons of water and 32,000 pounds of coal; the height of the tender above top of rail is 11 feet 3  $\frac{5}{8}$  inches; the inside measurement from bottom to top is approximately 6 feet; the trucks are 4-wheel trucks of the pedestal type with elliptical springs; side-bearings are located 2 feet 1 inch from the truck-center;



the wheels are 36 inches in diameter and made of cast steel and both pair of rear tank-truck wheels were applied new on April 9, 1937. The tank is equipped with  $\frac{1}{4}$  by 3 inch splash rods which extend laterally, longitudinally and vertically therein.

#### Discussion

The evidence indicates that as Train IS-20 was being hauled with the engine backing up at a speed not in excess of 20 miles per hour, the lead tender-truck wheels mounted the high rail of the 10 curve and became derailed. Examination of the derailed equipment failed to disclose any defect which could have contributed to the occurrence of the accident; there was no indication of anything dragging under the train nor of the train having run over a foreign object. The track, however, was poorly maintained; many ties were decayed, many loose spikes were found and some of the spikes were a half inch from the rail and the rail was considerably worn. While the gauge was good, the surface was irregular; in places the track being depressed 2 inches or more under load and at a point about 110 feet west of the point of derailment, a joint 1 inch low was found on the low rail of the curve. Little work, except tie replacements, had been done on this track in the last five years. In view of prevailing track conditions the speed of 25 miles per hour permitted for engines backing-up apparently is too high to provide an adequate margin of safety.

#### Conclusion

This accident was caused by irregular track conditions.

#### Recommendation

It is recommended that speed restrictions be placed in effect on this line which will provide for the safe movement of trains, and that an adequate degree of track maintenance be provided.

Respectfully submitted,

W. J. PATERSON,

Director.