

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN
ACCIDENT ON THE CHESAPEAKE AND OHIO RAILWAY NEAR
HOPETOWN, OHIO, ON DECEMBER 8, 1933.

February 15, 1934.

To the Commission:

On December 8, 1933, there was a derailment of a passenger train on the Chesapeake and Ohio Railway near Hopetown, Ohio, which resulted in the death of 1 employee and 2 trespassers, and the injury of 2 passengers, 2 mail clerks, 1 express messenger, 1 Pullman Porter and 3 employees. The investigation of this accident was held in conjunction with representatives of the Public Utilities Commission of the State of Ohio.

Location and method of operation

This accident occurred on the Northern Sub-division of the Cincinnati and Russell Divisions, which extends between N. J. Cabin and Columbus, Ohio, a distance of 99.3 miles, and is a double-track line over which trains are operated by time table, train orders, and a manual block-signal system. The accident occurred approximately 1 mile east of Hopetown; approaching this point from the west there is a $1^{\circ}30'$ curve to the right 1,771.2 feet in length, from which point the track is tangent for a distance of 167.3 feet, followed by a $5^{\circ}42'$ curve to the left 502.6 feet in length, the accident occurring on this latter curve at a point 175 feet from its western end, where the track extends through an 18-foot cut. The grade is descending for east-bound trains for more than 2 miles and is 0.16 percent descending at the point of accident.

The track is laid with 100-pound rails, 39 feet in length, with an average of 24 hardwood ties to the rail length, fully tie-plated, double-spiked on the inside and single-spiked on the outside, with 6 rail anchors to the rail length, and is ballasted with gravel to a depth of about 30 inches.

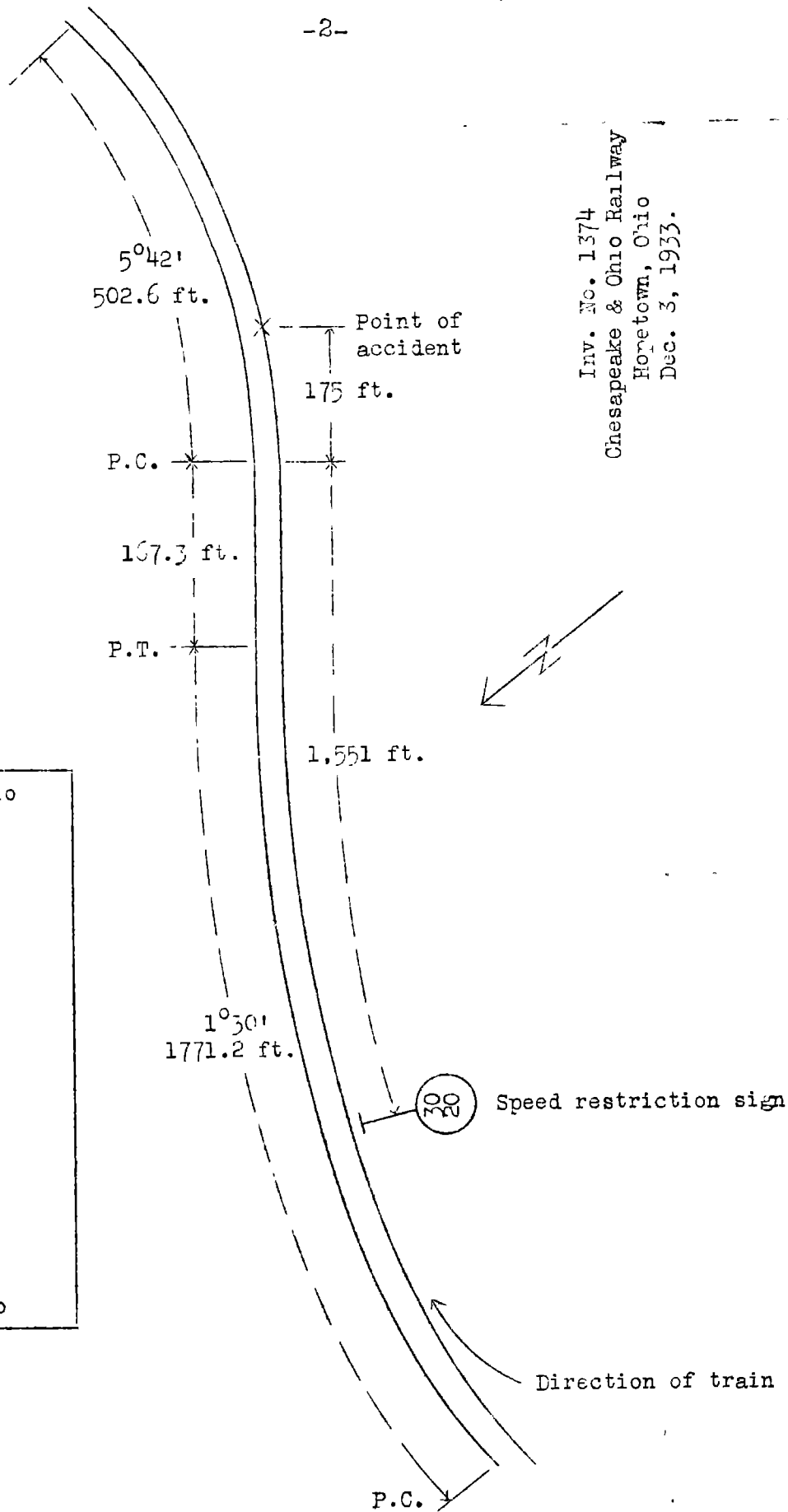
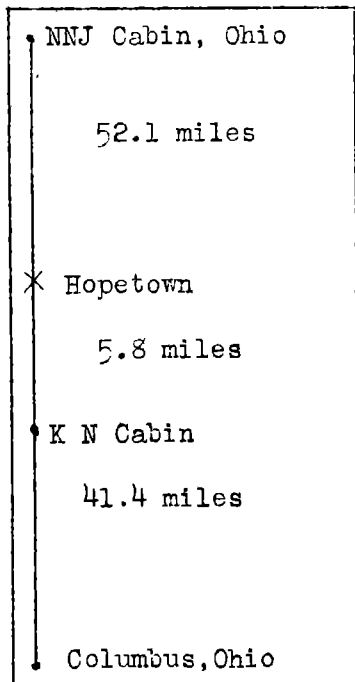
The maximum speed permitted for passenger trains in the territory in which the accident occurred is 65 miles per hour; in addition, there is a slow-board on the engineman's side of the track 1,551 feet west of the beginning of the curve on which the accident occurred, restricting the speed of passenger trains to 30 miles per hour.

The weather was cloudy at the time of the accident, which occurred about 11:22 p.m.

Description

East-bound passenger Train No. 46 consisted of 1 express car, 1 mail and express car, 1 combination coach and baggage car,

Inv. No. 1374
Chesapeake & Ohio Railway
Hopetown, Ohio
Dec. 3, 1933.



1 coach, and 3 Pullman sleeping cars, all of steel construction, hauled by engine 494, and was in charge of Conductor Sullender and Engineman Gresham. This train passed C.H. Cabin, 7.3 miles from Columbus, at 10:45 p.m., 14 minutes late, passed K.N. Cabin, the last open office, 41.4 miles from Columbus, at 11:16 p.m., 9 minutes late, and shortly after passing Hopetown it was derailed while traveling at a speed estimated to have been between 50 and 65 miles per hour.

The engine, tender, the first four cars and one pair of wheels of the fifth car were derailed. The engine and tender stopped on their right sides south of the track with the front end of the engine 315 feet east of the initial point of derailment. The first car stopped nearly upright in line with the engine and tender; the second car was on its left side with the floor of the car about over the center of the west-bound track and its forward end 44 feet beyond the engine; the third car remained upright and was diagonally across the two main tracks opposite the first car; the fourth car was leaning to the right at an angle of about 45° with its forward end against the first car and its rear end on the track, and the fifth car was partly derailed. The engine was considerably damaged and the right sides of the first and second cars were torn out for distances of 28 feet and 18 feet, respectively. The employee killed was the engineman, and the employees injured were the fireman, conductor and a scale inspector.

Summary of evidence

Fireman Lane stated that the brakes were properly tested before departing from Columbus and after leaving that point the usual running test was made; the only stop made en route was at Parsons, 5.3 miles from Columbus. After passing C.H. Cabin, 2 miles east of Parsons, the train attained a speed of approximately 65 miles per hour and after passing Fite, 12.2 miles east of Parsons, Fireman Lane said he informed the engineman that he thought the train was traveling too fast. Upon reaching a point about 2 miles from the point of accident the engineman crossed over to the fireman's side of the cab with his watch in his hand and said they had covered 34 miles in 29 minutes; the engineman then returned to his seat box and closed the throttle one notch. Fireman Lane waited for him to apply the brakes, but he did not do so until the fireman told him the train would not go around the curve at that speed; the engineman then applied the automatic brakes in service, keeping the brakes from applying on the engine by means of the independent brake valve, and Fireman Lane thought the exhaust from this application was still blowing when the derailment occurred. From the motion of the engine while it was being derailed, the fireman did not think that it ran on the ties at any time, but first tilted slightly, the track sliding with the engine, and then overturned; he estimated the speed at the time of the accident at 60 miles per hour. Fireman Lane said that prior to the accident the engineman appeared to be in normal condition and he did not know why he failed to apply the brakes

sooner than he did, while the reason he refrained from asking the engineman to apply them sooner was that this was the first east-bound trip he had ever worked with Engineman Gresham on this train and he did not know how he had been handling the air. Fireman Lane further stated that he discussed speed with the engineman before starting the previous trip, west-bound from Huntington, W. Va., to Columbus and when Engineman Gresham said he had been covering 92 miles in 90 minutes he told the engineman that if he kept this up he would turn the train over, and after reaching Columbus he told the engineman that he did not care for the job as the speed was too fast for him. Fireman Lane was a promoted man familiar with the territory, and said he had fired one of these runs about 2 years previously when the time was not so fast. The weather conditions were favorable for observation and the headlight was burning at the time.

Conductor Sullender stated that after the brakes were tested at Columbus a car inspector informed him that they were working properly, and the automatic brakes were used in making the stop at Parsons. After leaving Columbus he was engaged in collecting tickets but at the same time he noticed at different places that the train was traveling between 60 and 65 miles per hour and he did not think the speed was reduced prior to the accident as he felt no application of the brakes. He had just sat down in the combination car when it was derailed; as soon as he got up after the accident he noted the time was between 11:22 and 11:23 p.m. He was familiar with the speed restrictions in the vicinity of the point of accident and would have pulled the emergency cord had he known the exact location of the train just before it was derailed; he also said that the engineman had operated this train almost continuously during the past 4 years and had always reduced speed in accordance with restrictions.

Brakeman Finnicum was riding in the smoking compartment of the combination car approaching the point of accident and was not paying particular attention to the speed of the train, although he thought it was about 60 miles per hour, and he did not think this speed was reduced before the train was derailed as he did not feel an application of the brakes. Immediately after the accident he went ahead to protect against west-bound trains. Brakeman Snyder said that after leaving Parsons he rode in the smoking compartment of the rear car and estimated that the train was traveling at a speed of about 65 miles per hour when it passed K.N. Cabin, approximately 5 miles east of the point of accident, but thought this speed was materially reduced and that the train was traveling at the usual rate of speed at the time of the accident although he did not hear the brakes apply until just before the derailment occurred. After the accident he went back to flag but saw nothing about the track that could have caused the accident.

Express Messenger Hardesty, the regular messenger on the train, was riding in the first car, and from the general movement of the car he judged the speed at 50 miles per hour just previous to the accident and the brakes were not applied until a second or

two before the accident. Baggage man Shelton was riding in the baggage compartment of the third car and was paying no attention to the speed of the train or its location until he felt a light application of the brakes possibly 1 or 2 minutes before the train was derailed, which reduced the speed considerably, although he could not estimate the distance the train traveled after this brake application or its speed at the time of the accident.

General Air Brake Inspector Anderson stated that he was a passenger on the train and checked the inspection of the brakes while it was being made at Columbus and also talked with the engineman, who seemed to be in normal condition. Approaching the point of accident he was in his berth in the rear car and when the train passed over the N&W bridge, about 2 miles west of the point of accident, he knew the approximate location of the train; as he was familiar with the speed restrictions in that locality he momentarily expected to feel the brakes apply, but the train continued at about the same rate of speed until there were three sudden shocks, which occurred almost simultaneously. After the accident he examined the engine and upon finding the throttle closed and the brake valve in emergency position he concluded that the first shock was caused by an emergency application of the brakes and that the other two shocks occurred while the train was being derailed. He also said that he had ridden on an engine with Engineman Gresham in the past and it had not been the engineman's custom to exceed the speed limit on the curve on which the accident occurred.

Trainmaster Davidson stated that he had ridden on Train No. 46 several times during the past, the last time about November 27, without the knowledge of Engineman Gresham, and there was no tendency on his part to exceed the prescribed speed limits. He examined the derailed equipment both before and after it was picked up and found nothing that could have contributed to the cause of the accident, which he concluded was due to excessive speed.

Engine Inspector Jones stated that he inspected engine 494 before it departed from Detroit on Train No. 46 on the day of the accident and this inspection did not disclose any defects that could have caused the accident. Car Inspectors Queen and Cissna stated that they examined the brakes in making the air-brake test at Columbus and found all of them to be in proper working order.

Assistant Master Mechanic Flanagan examined the engine and tender after the accident and did not find any broken brake rods, brake beams down, or anything of that nature missing. There were no scars on the flanges of the wheels to indicate that the engine ran over any of the ties or bolts, or any indications that the wheels had crossed over the rails. Some of the cross members of the tender truck frame were broken and missing, but as these breaks were new it indicated they were broken as a result of the accident and did not contribute to its cause.

Supervisor of Track Broshears stated that he had walked over the track in the vicinity of the point of accident during the morning and found it to be in good condition. As soon as it became daylight on the morning following the accident he examined the track for a distance of approximately $1\frac{1}{2}$ miles west of the point of accident and the first marks of disturbance were two small marks on the ends of the ties, about 400 feet from where the engine stopped, which had the appearance of having been caused by the column bolts of the trailer box dragging over them. There were two rail joints pulled apart, one in the north rail about one and one-half or two rail lengths east of the marks on the ties and the other in the south rail near the engine, while the track itself was out of line. He found nothing about the condition of the track that could have caused the accident.

Assistant Division Engineer Pattison made an examination of the track after the accident and found marks on the south ends of the ties, beginning with slight scratches which increased in depth for about 16 ties, from which point the ends of the ties were completely torn off up to the rear of the tender. The north rail was pulled apart 9 feet west of the first mark on the outside of the south rail, and 216 feet east of this point the south rail was pulled apart, both of these separations being at the joints, with a space of 15 inches between the ends of the rails; there were no marks to indicate that the receiving ends had been struck by any of the wheels. Beginning at the first break the track was out of line for a distance of approximately 300 feet, the maximum dislocation being about 5 feet; the ties and rails of this portion of the track remained intact, with the ties inclined towards the south at an angle of about 30° . The only wheel marks appearing on the track were 8 inches inside the south rail and they extended for a distance of 40 feet to the forward truck of the fourth car, indicating they were made by that truck. There was no other definite indication of anything dragging or any marks on the rails or fastenings to indicate that any part of the equipment had failed. The super-elevation at the point where the first marks appeared on the south ends of the ties was $2\frac{1}{4}$ inches, but there were indications the track had been disturbed at this point; it was Mr. Pattison's opinion that the engine started to overturn at some point farther west and that the first marks on the south ends of the ties were made by the trailer truck column bolts, and he said this opinion was supported by finding the retracker from the tender 64 feet east of the first mark, with the lid from the tender tool box beside it, while 40 feet farther east was the step from the right side of the tender.

Division Engineer Dunn stated that after examining the track he decided that the accident was caused by excessive speed, coupled with a slight buckling of the track under the engine due to the straightening effect of the engine when the brakes were applied and not as a result of any weakened condition of the track, basing his opinion as to the cause on the absence of wheel marks on the rails or ties at the point of derailment. In his

opinion the track was sufficiently ballasted to hold it in place under a train being operated at a speed of 45 miles per hour, and from past experience he estimated that the train was traveling at a speed of 60 miles per hour at the time it was derailed.

Engine 494 is of the 4-6-2 type, with a driving wheel base of 13 feet and a total wheel base of 35 feet 7 inches; the tender is equipped with 6-wheel trucks with a total wheel base of 34 feet 4 inches, and has a water capacity of 16,000 gallons and a coal capacity of 20 tons. The loaded weight, engine and tender, is 631,500 pounds. The engine was built in 1926 and received class 4 repairs in July, 1933.

Measurements were taken subsequent to the accident at each rail joint on the curve west of the point of accident, and for the first 10 joints these measurements showed a variation in gauge of from $1/8$ inch narrow to $3/8$ inch wide; the super-elevation was from $3\frac{1}{4}$ to $3\frac{3}{4}$ inches, and the degree of curvature ranged from $4^{\circ}45'$ to $6^{\circ}30'$. An examination of the equipment and track by the Commission's inspectors failed to show any defects in the equipment or any irregularities in the track which had any material effect as a contributing cause of the accident. The first marks of derailment were on the ties south of the south rail and consisted of a light mark about 8 inches from the ends of the ties, extending over seven ties, which appeared to have been made by a $3/4$ inch bolt; another mark starting at the same point had the appearance of a light beveled mark, located on the extreme outer ends of the ties and becoming heavier for a distance of 16 ties, from which point the ends of the ties were broken off at the base of the rail for a considerable distance; it was thought that these marks were made by some part of the overturning equipment, but that they were not made by the trailer bolts. The first marks on the ties were considered as the initial point of derailment but it appeared that the forward part of the train was actually turning over before it reached that point, and slightly beveled surfaces about $3\frac{1}{2}$ feet in length on the outer edge of the ball of the south rail at distances apart corresponding to distances between the wheels of the engine indicated that the engine actually left the south rail in turning over when the head end of the engine was about 88 feet east of the marks on the ties.

Conclusions

This accident was caused by excessive speed on a sharp curve.

According to the statements of members of the train crew, as well as Air Brake Inspector Anderson, they talked to Engineman Gresham before the train left Columbus and he appeared to be in normal condition, while Fireman Lane noticed nothing unusual about his condition en route. The fireman said that he called the engineman's attention to the high speed on two occasions, the last time when the train was approximately 2 miles from the point of accident, but the engineman did not apply the brakes until the fireman told him they could not go around the curve at that speed,

which he estimated at 60 miles per hour, but by that time the curve had been reached and the derailment occurred. The statements of other employees and officials riding on the train also indicated that the speed was excessive, and this was supported by the position and condition of the wreckage and the absence of wheel marks on the ties.

Engineman Gresham was an experienced man, was familiar with the physical characteristics of this line and was operating his regular train with the regularly assigned engine; it is possible, however, that in crossing over to the fireman's side and talking with him about the speed, which had averaged 68 miles per hour for 34.1 miles between C.H. and K.N. Cabins, he may have missed some land mark, or the reduce-speed board, and consequently did not realize he had reached the territory where speed was restricted to 30 miles per hour. It was not definitely established whether the brakes were applied before the train was derailed, as some of the employees riding on the train felt no brake application prior to the accident while others felt it just before the accident occurred. Subsequent to the accident, however, Air Brake Inspector Anderson found the throttle closed and the brake valve in emergency position, which indicated that Engineman Gresham was attempting to reduce the speed of his train, but that he failed to begin braking soon enough.

Respectfully submitted,

W. P. BORLAND, .

Director.