

INTERSTATE COMMERCE COMMISSION
WASHINGTON

INVESTIGATION NO. 3250
THE BALTIMORE AND OHIO RAILROAD COMPANY
REPORT IN RE ACCIDENT
AT NEWARK, OHIO, ON
APRIL 29, 1949

SUMMARY

Date: April 29, 1949
Railroad: Baltimore and Ohio
Location: Newark, Ohio
Kind of accident: Derailment
Train involved: Passenger
Train number: 36
Engine number: 5237
Consist: 6 cars
Estimated speed: 10 m. p. h.
Operation: Hand signals
Tracks: Four; tangent; level
Weather: Clear
Time: 1:38 a. m.
Casualties: 7 injured
Cause: Insecure condition of track

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 3250

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

THE BALTIMORE AND OHIO RAILROAD COMPANY

June 13, 1949

Accident at Newark, Ohio, on April 29, 1949, caused
by an insecure condition of the track.

REPORT OF THE COMMISSION¹

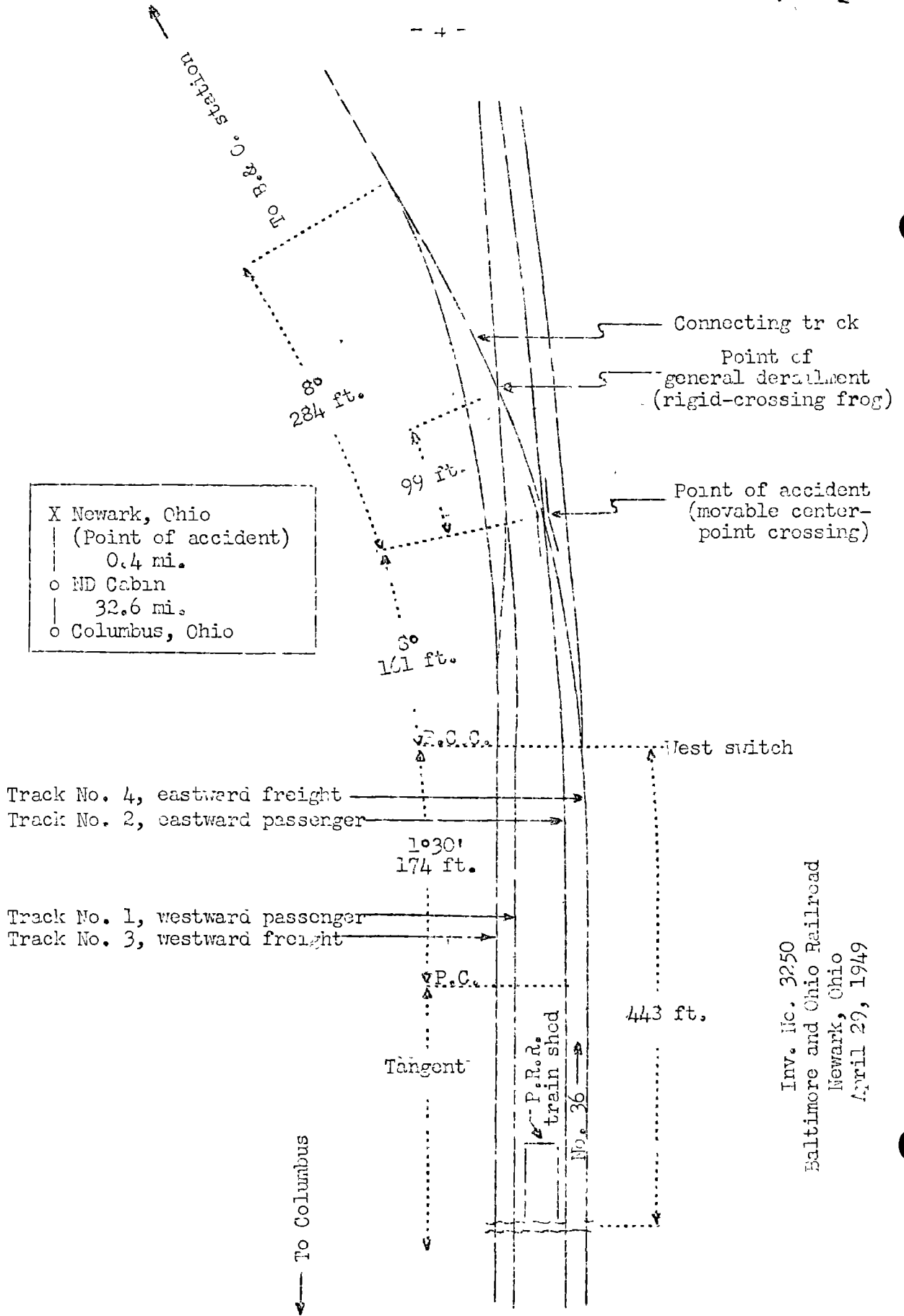
PATTERSON, Commissioner:

On April 29, 1949, there was a derailment of a passenger train on the Baltimore and Ohio Railroad at Newark, Ohio, which resulted in the injury of five passengers, one railway-mail clerk and one train-service employee.

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Under 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.

X Newark, Ohio
 | (Point of accident)
 | 0.4 mi.
 o ND Cabin
 | 32.6 mi.
 o Columbus, Ohio



Inv. No. 3250
 Baltimore and Ohio Railroad
 Newark, Ohio
 April 29, 1949

Location of Accident and Method of Operation

This accident occurred on that part of the Columbus and Newark Division extending between Columbus and Newark, Ohio, 32.93 miles. It is operated jointly by the Baltimore and Ohio Railroad and the Pennsylvania Railroad, and is a four-track line, over which P.R.R. trains moving with the current of traffic are operated by automatic-block and cab-signal indications, and B. & O. R.R. trains are operated by automatic block-signal indications. The main tracks are designated from south to north as No. 4, eastward freight; No. 2, eastward passenger, No. 1, westward passenger; and No. 3, westward freight. At Newark a connecting track extends between track No. 4 and track No. 3 and crosses tracks Nos. 2 and 1 at grade. The main tracks and the connecting track are maintained by the B. & O. R.R. The west switch of the connecting track is located in track No. 4 at a point 370 feet east of the P.R.R. station at Newark, and it is facing-point for east-bound trains. Track No. 2 is crossed by means of a movable center-point crossing located 161 feet east of the west switch, and track No. 1 is crossed by means of a rigid crossing located 99 feet east of the movable center-point crossing. Trains are operated over the connecting track by hand signals. The accident occurred on the connecting track at a point 8 feet 6 inches east of the movable center-point crossing. From the west there is a 1°30' curve to the left 174 feet to the west switch of the connecting track, and then an 8° curve to the left 161 feet to the point of accident and 284 feet eastward. The grade is level.

At the point of accident the track structure consists of 130-pound rail laid on 7-inch by 9-inch treated ties spaced 20 inches between centers. It is fully tieplated with double-shoulder tieplates, double-spiked, and is provided with 4-hole, 24-inch joint bars and an average of 1 rail anchor per tie. It is ballasted with 6 inches of cinders on top of 18 inches of crushed stone.

The structure of the movable center-point crossing consists of 130-pound rails, rigid frogs and movable center-points. This crossing has an angle of 8°49', and is laid on 52 treated switch ties. It can be lined for two routes, but is normally lined for through movement on track No. 2. Its diagonal length along the axis between the points of the rigid-type frogs is 63 feet 8-9/16 inches. The west rigid frog has an angle of 10°36'51" and the east rigid frog has an angle of 6°31'47". Both of these frogs are protected by guard rails. The two opposed pairs of movable center-points of the crossing are 10 feet in length and they are chamfered

to fit the angles of their respective knuckle rails. The north and the south knuckle rails are 30 feet in length. They have knuckle angles of $8^{\circ}49'48''$, and are provided with manganese inserts. The movable center-points are arranged for a throw of 4-1/2 inches, and they move on slide plates, which extend under the movable point and its knuckle rail. Each movable point when closed has a bearing of 33-3/4 inches against its knuckle rail. The gage side joint bar connecting the heel of each switch rail to the abutting rail is bent slightly away from the rail, and the first joint-bar bolt is inserted in a pipe thimble placed between the joint bar and the switch rail to permit free hinge motion of the switch rail during its operation. The two plates under the rail joint at the hinged end of the southeast movable point are not provided with shoulders but they are provided with holes for the insertion of track spikes to prevent outward lateral movement of the heel of the movable point. These holes are located 8 feet 6-1/4 inches and 10 feet 4 inches east of the point of the southeast movable point. The movable center-points are maintained in proper relation by two pairs of switch rods, which, in turn, are connected to a hand-operated throwing mechanism, located north of the track near the center of the crossing.

Columbus and Newark Division timetable special instructions read in part as follows:

HAND SIGNALS AND FLAGGING.

* * *

Switchtenders are located at and have charge of the switches at following locations:

Newark:
First Street:
All Switches.

* * *

Instructions governing the maintenance-of-way department of the B. & O. R.R. read in part as follows:

325. Full spiking means driving one spike on each side of the rail base in every tie, * * *

326. The track must be full spiked at all times. The spikes must fully engage the flange of the rail. * * *

387. * * *. On curves over five (5) degrees and up to and including ten (10) degrees, a gauge of four feet eight and three-quarters inches (4'8-3/4") shall be used. * * *

448. Care should be taken to see that the correct gauge is maintained at all frogs and switches.

The maximum authorized speed for any movement through crossings and switches in this territory is 10 miles per hour.

Description of Accident

No. 36, an east-bound passenger train, consisted of engine 5237, one express car, one baggage car, one baggage-mail car, one baggage car, one sleeping car and one coach, in the order named. All cars were of all-steel construction. This train departed from Columbus at 1:01 a. m., 13 minutes late, passed ND Cabin, 0.4 mile west of Newark, at 1:35 a. m., 5 minutes late, and stopped on track No. 4 clear of the west switch of the connecting track. Immediately afterward it proceeded and entered the connecting track, and while moving at an estimated speed of 10 miles per hour it was derailed at the movable center-point crossing.

The engine, the tender and the front truck of the first car were derailed. The engine stopped 137 feet east of the point of derailment and between track No. 1 and track No. 2. It leaned to the south at an angle of 45 degrees. The tender and the first car remained upright. The engine was somewhat damaged.

The fireman was injured.

The weather was clear at the time of the accident, which occurred about 1:38 a. m.

Engine 5237 is of the 4-6-2 type, and its total weight in working order is 286,600 pounds, distributed as follows: Engine truck 57,600 pounds; driving wheels, 174,000 pounds; and trailer truck, 57,000 pounds. The specified diameter

of the engine-truck wheels, driving wheels, and trailer-truck wheels, are, respectively, 33, 74, and 44 inches. The length of the engine-truck wheelbase is 7 feet 2 inches. The driving wheelbase is 13 feet long, and the total length of the engine wheelbase is 34 feet 11 inches. The engine truck is provided with a rocker-type constant-resistance device, and the trailer truck is provided with rocker-type centering devices.

The last class 3 repairs were completed on April 8, 1948. The last trip inspection and repairs were completed on April 26, 1949. The accumulated mileage since the last class 3 repairs was 90,000 miles.

Discussion

No. 36 stopped on track No. 4 about 200 feet west of the west switch of the connecting track. After a hand signal had been received from the switchtender, the train started and was moving on the connecting track at an estimated speed of 10 miles per hour when the engine and tender and the front truck of the first car were derailed at the movable center-point crossing.

Examination of the track after the accident disclosed that the first mark of derailment was a wheel-tread mark on the top surface of the north knuckle rail. This mark started at a point 5 feet 2 inches east of the facing movable center-point and extended diagonally inward and eastward a distance of 3 feet 4 inches to the gage side of the rail. At that point an abrasion on the gage side of the head of the rail indicated that a wheel had dropped inside the rail. At a point 2 feet 4 inches east of this latter mark, a wheel mark appeared on the base of the rail 1 inch from the inside edge, and it continued eastward a distance of 13 inches. At a point 1 foot 11 inches from the east end of this mark, the west end of an insulated rail joint bore a heavy wheel mark, and the inside nut of the first joint bolt was sheared off. A flange mark appeared near the outside edge of the top surface of the south rail 2 inches east of the west end of the insulated joint in the north rail. This mark continued diagonally eastward 3 inches to the outside of the rail. A flange mark appeared on a tie 8-1/2 inches inside the north rail and 2 feet 10 inches east of the west end of the insulated rail joint. At a point 11 feet 1 inch east of the flange mark on the tie, a wheel mark appeared on the head of the north guard rail. This mark indicated that another engine-truck wheel was

derailed at that point. Easterly from this point to track No. 1, two flange marks appeared on the ties inside the north rail. Beginning at a point 3 feet east of the flange mark on the top of the south rail, flange marks appeared on the tops of the outside spikes and tie plates of the south rail throughout a distance of 19 feet 2 inches to the north rail of track No. 2. There was a flange mark across the north rail of track No. 2. From this point eastward flange marks appeared on the ties to the point of general derailment at track No. 3.

Examination of engine 5237 after the accident disclosed no defective condition which could have contributed to the cause of the derailment. The pilot was firmly secured to the pilot beam, and its bottom surface was 5-1/2 inches above the tops of the rails. The engine-truck assembly and the constant-resistance device were in good condition. The male center casting entered the female center casting 2-3/4 inches. These castings were well lubricated, and there was no indication of binding. The flanges and the treads of all wheels of the engine were of full contour. The thicknesses of the engine truck flanges were as follows: Right No. 1, 1-8/32 inches; left No. 1, 1-5/32 inches; right No. 2, 1-8/32 inches; and left No. 2, 1-8/32 inches. The back-to-back measurements of these wheels varied 1/16-inch. The engine-truck transverse braces and pedestal tie-bars were bent, and several pedestals were broken as a result of the derailment. The spring assemblies were in good condition, and there was no indication of unequal distribution of weight. All wheels were tight on their axles, and all tires were tight on their wheel centers. The lateral motion of all pairs of wheels was within the specified limits of the carrier.

After the accident the gage of the track at the heel of the southeast movable center-point was found to be 4 feet 10-7/8 inches. At the point where the left-front engine-truck wheel dropped inside the north rail the gage was 4 feet 10-1/2 inches. At a point 3 feet 6 inches westward the gage was 4 feet 9-3/4 inches, and at the center of the knuckle rails it was 4 feet 9 inches. The rail joint at the heel of the southeast movable point was not spiked on the outside. A spike previously had been provided on the outside of the east end of the rail joint but the head of the spike had been sheared off and the end protruding through the slide plate was worn smooth by contact with the base of the rail joint. The double-shoulder tie plate on the first tie east of the heel of the southeast movable point had apparently been forced

outward on the tie approximately 2 inches throughout a considerable period previous to the time of the accident, and the spikes holding it were badly worn. The spikes were withdrawn from the tie about 3 inches. They were bent outward and were loose in the tie. The tie plate on the second tie east of the rail joint also had been forced outward previously, and the spike holes in this tie were worn. The tie plate on the third tie east of the rail joint was securely spiked. There was no evidence of dragging equipment or of any obstruction having been on the track. Neither of the movable points was bent permanently as a result of the derailment. None of the movable points was provided with rail braces, and there was no brace rail from the outer end of the bearing surface against the knuckle rail to the heel of the point. The absence of track spikes on the outside of the rail joint at the heel of the southeast movable point and the worn and loose condition of the outside spikes of the two ties east of the joint left a section of rail 12 feet 5 inches in length on the 8° curve without bracing to prevent its outward movement while a train was passing over it. Gage plates were provided only at the switch points.

The gage at the point where the wheel dropped inside the northeast movable point was 58-1/2 inches, without lateral pressure. The back-to-back measurement of the No. 1 pair of engine-truck wheels was 53-3/16 inches, the flange of the right wheel was 1-1/4 inches thick, and the rim of the left wheel was 5-1/2 inches thick, a total of 59-15/16 inches. The outside edge of the rim of the left wheel was rounded on a radius of 5/8 inch. To permit the left wheel to drop inside the rail the gage would have to be spread at least 13/16 inch at the point of maximum deflection, which is approximately the center of the section of rail that was not braced on the outside. The left front engine truck wheel dropped inside the rail within 3 inches of that point. The outward deflection of the east end of the joint bar, 1 foot 11 inches east of the point where the wheel dropped inside the rail, was at least 7/8 inch, or not less than 1/16 inch deflection in excess of that which would permit a wheel to drop inside the rail.

The section foreman said that he last inspected this crossing on April 22, 7 days prior to the accident. At that time he considered it to be properly maintained, although both spikes were missing from the rail joint. At that time the gage of the switch points was 4 feet 9-1/4 inches, which was within the limit permitted by the carrier. He said that at that time he saw no evidence of tie plate movement, and that the spike heads were in contact with the base of the rail.

Cause

It is found that this accident was caused by an insecure condition of the track.

Dated at Washington, D. C., this thirteenth day of June, 1949.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,
Secretary.