

Inv-2288

INTERSTATE COMMERCE COMMISSION
WASHINGTON

REPORT OF THE DIRECTOR
BUREAU OF SAFETY

ACCIDENT ON THE
WABASH RAILWAY

CHICAGO RIDGE, ILL.

SEPTEMBER 3, 1938.

INVESTIGATION NO. 2288

SUMMARY

Inv-2288

Railroad:	Wabash
Date:	September 3, 1938
Location:	Chicago Ridge, Ill.
Kind of accident:	Derailment
Train involved:	Passenger
Train number:	10
Engine number:	665
Consist:	8 cars
Speed:	76 m.p.h.
Operation:	Timetable, train orders and manual block system.
Track:	Double; tangent; 0.018 percent descending grade northward.
Weather:	Clear
Time:	5:17 p.m.
Casualties:	24 injured
Cause:	Broken journal, due to overheating.

October 4, 1938.

To the Commission:

On September 3, 1938, there was a derailment of a passenger train on the Wabash Railway at Chicago Ridge, Ill., which resulted in the injury of 21 passengers and 3 employees not on duty. The investigation of this accident was made in conjunction with the Illinois Commerce Commission.

Location and method of operation

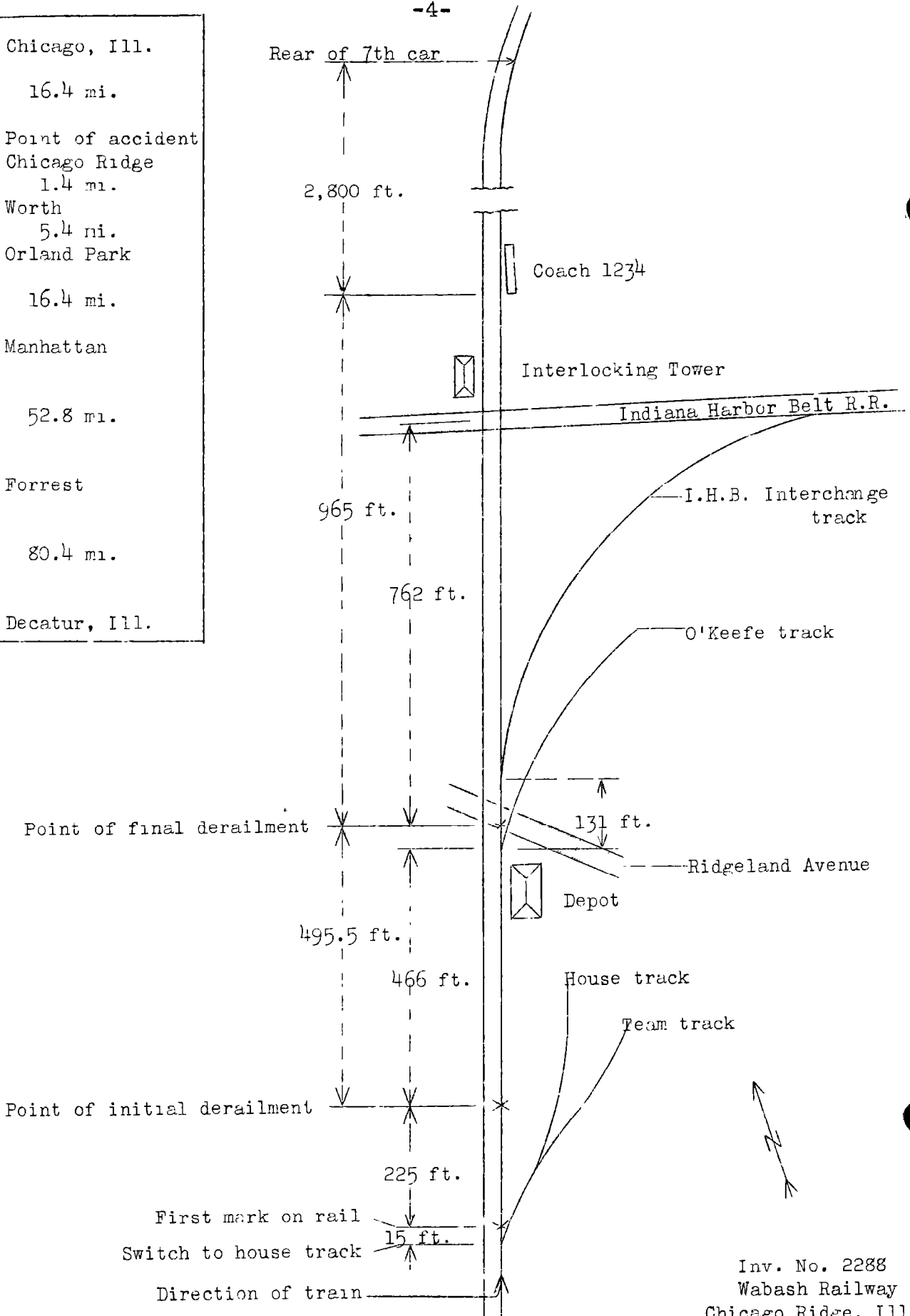
This accident occurred on that part of the Decatur Division designated as the Sixth District which extends between Western Indiana Jct. and Forrest, Ill., a distance of 84.4 miles. In the vicinity of the point of accident this is a double-track line over which trains are operated by timetable, train orders and a manual block system. The derailment occurred on the northward main track 412 feet south of the station at Chicago Ridge, Ill. From the south the track is tangent for more than 9,000 feet to the point of accident, and for 2,865 feet beyond. The grade is generally descending for north-bound trains, being 0.018 percent at the point of accident. The track is laid with 112 pound rail, 39 feet in length, with an average of 24 treated hardwood ties to the rail length, fully tie-plated; it is single spiked, with 12 inches of crushed rock ballast under the ties, and is equipped with 6 rail anchors to the rail length.

A facing-point switch located 224.5 feet south of the initial point of derailment leads to a house track east of the main track, and there are other facing-point switches located at points 466 feet and 597 feet north of the point of derailment. At a point 1,250 feet north of the initial point of derailment, two main tracks of the Indiana Harbor Belt Railroad cross the Wabash main tracks at an angle of $81^{\circ} 43'$.

Rule 627, of the book of operating rules, reads in part as follows:

Bridge and section foremen, track walkers, pumpers, signal maintainers, telegraph linemen, station employees and watchmen must observe trains closely and if anything dangerous is noted, such as a loose wheel, defective coupling, hot bearing, brake rod or brake beam dragging,*** must call attention of train and enginemen to the fact by signal. Train and enginemen should always observe trackmen, bridgemen, and other employees as they pass, and look out for signals from them.

o Chicago, Ill.
16.4 mi.
X Point of accident
o Chicago Ridge
1.4 mi.
o Worth
5.4 mi.
o Orland Park
16.4 mi.
o Manhattan
52.8 mi.
o Forrest
80.4 mi.
o Decatur, Ill.



Inv. No. 2288
 Wabash Railway
 Chicago Ridge, Ill.
 Sept. 3, 1938

The maximum authorized speed for passenger trains is 80 miles per hour in this vicinity.

The weather was clear at the time of the accident, which occurred about 5:17 p.m.

Description

No. 10, a north-bound passenger train, consisted of one combination mail and baggage car, two chair cars, one dining car, one Pullman sleeping car, two parlor cars, and one coach, in the order named, of all-steel construction, hauled by engine 665, of the 4-6-2 type, and was in charge of Conductor McCullough and Engineman Dely. This train departed from Decatur, Ill., 156.4 miles south of Chicago Ridge, at 2:32 p.m., according to the train sheet, 11 minutes late, passed Orland Park, the last open telegraph office, at 5:10 p.m., 20 minutes late, and was derailed while approaching the station at Chicago Ridge at a speed of 76 miles per hour as indicated by the speed recorder tape.

The engine and the first seven cars were not derailed or damaged. The eighth car, coach 1234, which had been added to the train at Decatur, became detached from the train and was derailed to the right of the northward main track; it stopped nearly in line with the track at a point 1,460 feet north of the initial point of derailment, with the body of the car tilted to the east at an angle of 35°. The rear truck, which was of the 6-wheel type, was practically demolished and torn from the car; the N-3 journal, which was the lead journal on the right or east side, was broken off. Two pairs of wheels, including the one with the failed journal, were with the truck and the other pair was found some distance from the track.

Summary of evidence

Engineman Dely stated that a terminal air-brake test was made at Decatur, and a running test was made when leaving that point; during both of these tests the brakes functioned properly. Nothing unusual occurred in the handling of the train to the point of accident. He attempted to observe the condition of his train while moving around curves at various points but could not see the rear car because of smoke and dust. He did not receive any hot-box signals from any one, and his first knowledge of anything wrong came when the brakes were applied in emergency at Chicago Ridge. The speed at that time was about 75 miles per hour. At the time of the accident the weather was clear.

Fireman Jackson stated that he had made observations of the train at various points, but was not aware that anything was wrong until the towerman at the Indiana Harbor Belt Railroad crossing

in Chicago Ridge gave a hot-box signal; the accident occurred almost simultaneously with the warning.

Conductor McCullough stated that coach No. 1234 had been added to the train at Decatur. At Forrest, 76 miles south of Chicago Ridge, he saw the car inspector inspect the train but the inspector did not report to him concerning its condition. He saw the operators at Manhattan, Brisbane, and Orland Park, 23.2, 18.2, and 6.8 miles, respectively, south of the point of accident, but none of them gave a hot-box signal. The operator at Manhattan was located on the east side of the train, and the operators at Brisbane and Orland Park were located on the west side of the train. The last time he had been in coach 1234 was at Bement, 145.9 miles south of the point of accident; at the time of the accident he was in the third car, and had no warning that anything was wrong until the brakes were applied in emergency.

Flagman Hopkins stated he was in the rear end of coach 1234 when the accident occurred; he had been in that car continuously since leaving Decatur except for a short time after leaving Forrest. He stationed himself on the rear platform while passing open block stations, and at each of these he received a proceed signal from the operator. At various favorable points he opened the rear vestibule doors and inspected the train, but he did not at any time detect the odor of a hot box or hot wheels. At Orland Park he had both vestibule doors open but did not notice anything wrong with the train; also at this point, he received a proceed signal from the flagman of a south-bound train. At Forrest the car inspector looked over the west side of the train and then passed around the rear end to the east side. As the train approached Chicago Ridge the coach began to sway violently; this was the first intimation the flagman had that the train was in trouble.

Brakeman Morgret, deadheading, stated that he had ridden on the rear platform of coach 1234 shortly before the accident and had not smelled burning waste nor had he seen any indication of a hot box.

The members of the train and engine crews of No. 99, stated they had observed No. 10 pass at Manhattan and did not notice any indication of a hot box.

Conductor Fullis and Flagman Harvey, of No. 21, did not notice any indication of a hot box on No. 10 when that train passed them at Orland Park.

Car Inspector Makinson stated he inspected coach 1234 on No. 10 at Forrest, Ill., on the day of the accident, and found no indication of unusual heating of the journals.

Operator Long, at Manhattan, 23.2 miles south of Chicago Ridge, was on the ground on the east side of the track when No. 10 passed; he saw the flagman on the rear platform but did not notice any indication of a hot box.

Operator Nelson, at Brisbane, 18.2 miles south of Chicago Ridge, was on the platform west of the tracks when No. 10 passed; he saw the flagman closing the rear door as they passed, but did not notice any indication of a hot box.

Operator Quigley, at Orland Park, 6.8 miles south of Chicago Ridge, stated that he was on the platform west of the tracks when No. 10 passed and gave a proceed signal to the flagman. He did not notice any indication of a hot box, but shortly after news of the derailment was received a boy, named Delbert Lillwitz, told him that he had seen fire blazing around a wheel at the rear of the train as it passed the station.

Section Foreman Mumbower stated that he was on the platform on the west side of the track at Orland Park when No. 10 passed and he did not notice any indication of a hot box. He gave a proceed signal to the flagman.

Delbert Lillwitz, aged eleven, of Orland Park, stated that on the afternoon of September 3, he was playing on the east side of the track near the station and saw fire around a wheel at the rear of a passing passenger train.

Agent Jennie Martin, at Worth, Ill., 1.4 miles south of Chicago Ridge, stated that she and Postmaster Tobey were on the platform on west side of the track when No. 10 was approaching, and smoke was seen to be issuing from the east side of the train. Postmaster Tobey who had crossed over to the east side in order to determine the source of the smoke informed her it was from a hot box. Immediately after No. 10 had passed she notified the dispatcher by telephone. She did not see anyone on the rear of the train.

Postmaster Tobey corroborated Mrs. Martin's statement, and in addition stated that he was unable to determine the cause of the smoke in time to give the engineman a signal.

Dispatcher Fightmaster stated that upon receiving information of the hot box from Agent Martin he immediately notified the operator at Chicago Ridge.

Operator Lee, of Chicago Ridge, stated that at the time the dispatcher notified him concerning the hot box, No. 10 had already reached the I. H. B. crossing and he had no time to flag it. He gave the fireman a hot-box signal, and at the same time he saw the rear car become derailed.

Supervisor Potter stated that the outer end of a journal was found 31 feet east of the center line of northward track and 792.5 feet north of initial point of derailment.

Superintendent Lind stated that he arrived at scene of accident at 6:05 p.m. and the broken-off piece of the journal was still too warm to pick up.

General Car Foreman Reynolds stated he arrived at the scene of accident about 1½ hours after the occurrence, and found the journal broken off the right side of the lead wheel of the rear truck; it was still hot. The metal at the break showed no sign of twisting but appeared to be pulled apart. The stub end remaining on the axle was ground off by being battered by the box. It was his opinion the accident was caused by the overheated journal.

Car Inspector Clark of Decatur stated he inspected coach 1234 thoroughly just before it was coupled to No. 10 and found all 12 journals packed according to standard requirements; he added 1 gallon of oil, divided equally among the 12 boxes.

Coach Shop Foreman Eagleton, Decatur, stated that the following work was performed on coach 1234 just prior to the trip on which the derailment occurred:

- 8 equalizers removed and straightened
- 6 pairs 5 by 9 by 36 inch steel wheels applied
- truck frames trammed
- 12 journal boxes cleaned
- 12 dust guards applied
- 12 journal brass 5 by 9 inch applied
- 12 " boxes re-packed
- Air brakes cleaned and tested.

Machine Shop Foreman Baldwin, of Decatur, Ill., stated that each of the axles applied to coach 1234 in August, 1938 was placed in a gap lathe and the journals were trued where necessary; all journals were rolled and burnished. A careful inspection of all axles applied revealed no defects. Wheels were turned, gaged, and checked for position. The size of the journals was 5 by 9 inches, meeting standard A.A.R. requirements.

Car Truck Repairmen Barger and Key stated they applied the 6 pair of wheels to coach 1234 August 29, 1938, and the journals were all right. They removed the dust guards, blew out the boxes with air, and wiped them dry. A spotting liquid was used to secure a perfect fit, and the bearings were scraped where necessary. After proper fit was secured oil was applied to the brass, and it was set on the journals after the wheels were applied to the truck.

Repairman Walsh stated he packed the boxes of coach 1234, August 29, 1938, in accordance with approved A.A.R. standards and used 4 gallons of oil in the 12 boxes, making two applications of oil two to three hours apart.

An analysis of the metal in the broken journal was made by the R. E. Hunt Company, as follows:

Analysis	Broken end of journal	Large end of axle near wheel seat.	A.A.R. specifications
Percent Carbon	0.51	0.55	0.40 - 0.55
" Manganese	0.56	0.56	0.50 - 0.90
" Phosphorous	0.021	0.021	0.05 max.
" Sulphur	0.033	0.033	0.05 max.

The chemical constituents of the failed axle were within the requirements of the A.A.R. specifications for car axles.

Observations of Commission's Inspectors

An inspection of the damaged trucks disclosed that an equalizer of the rear truck made the first mark on the stock rail of the house-track switch. The rear truck was demolished; the wheels and axles, journal boxes and equalizers were torn from the frame, and frame and pedestals broken. The wheels were cut and marked, showing violent contact had occurred, and the axles were bent and showed new abrasions. The journal on the right side of the lead wheel of the rear truck was broken off irregularly and showed evidence of excessive heating; this piece measured 9 1/4 inches at longest point and its diameter 4 5/8 inches near the center of its length. The full 5-inch diameter remained only a short distance near the collar. The fiber of the metal showed it had been heated and torn loose from the axle rather than twisted off.

The steel wedge had run on this broken piece of journal long enough to cut it to a contour corresponding to the broken off piece. No part of the journal brass was found. The stub end of journal remaining on the axle was badly cut and had been heated to the extent that the metal had fused and smeared. When the journal failed the entire load at this point would be on this small stub which explains why it was heated to a higher degree than the detached portion.

Directly over the location of the failed axle the longitudinal braces of the truck which extend from the bolster housing to the end members of the frame were bent upward, and were cut and ground to a depth of about 1/2 inch; there were corresponding marks

on the axle. These marks indicated contact between the braces and the axle after the journal failed.

There was no indication that track conditions were in any way responsible for the occurrence of the accident.

Observation of the rebuilding of car trucks at the Decatur shop disclosed that all axles are carefully tested and journals trued, inspected, rolled and burnished before application.

The speed recorder tape of engine 665 on No. 10, September 3, 1938, disclosed that the maximum speed of 80 miles per hour was attained at various points. At the time of accident the train was moving at the rate of 76 miles per hour, and this speed had been maintained for a distance of about $1\frac{1}{2}$ miles.

Discussion

The evidence indicates that the wheels and axles of coach 1234 were changed just prior to the trip on which the accident occurred; all journals were tested, trued, burnished and inspected before application. The journal bearings were spot fitted and all boxes packed and well oiled according to A.A.R. standards. An inspection of the journals was made just prior to coupling the car to No. 10 and additional oil was supplied at that time. The journals were inspected at Forest after moving 80 miles and there was no indication of heating.

Although the flagman rode in the rear of this car nearly all of the time en route, and was on the rear platform at various places with the vestibule doors open, he did not detect any indication of a hot box. Other members of the crew who scanned the train at favorable points noticed no sign of a hot box. Employees, along the route, who observed No. 10 pass saw nothing to indicate a hot box and signals were exchanged with the flagman on the rear of the train as provided in rule 627.

Two employees, standing on the west side of track at Orland Park, 6.8 miles south of the point of accident failed to notice anything wrong with the train, however, after news of the derailment was received a boy who had been on the east side of the train at that point stated that he noticed a blazing wheel as the train passed; this was the first statement which indicated the existence of a hot journal. The postmaster at Worth, 5.4 miles farther north, saw a blazing journal on No. 10 from some distance as it approached, and reported it to the agent. The agent immediately notified the dispatcher, who, in turn, notified the towerman at Chicago Ridge, but too late to avert the accident.

The condition of the journal and its wedge and box after the accident, and the fact that after an hour or more had elapsed the

broken-off piece of journal was too hot to pick up is conclusive evidence that the journal had been intensely heated, but the cause of the heating could not be determined.

The fact that the piece of journal was cut and ground, and the wedge was ground to fit the contour of this piece of journal leaves no doubt that the heating and cutting occurred prior to the breaking off of this piece of journal.

With trains moving at speeds up to 80 miles per hour, a journal which becomes heated may quickly cut and develop into a hazard, and it is evident that this occurred in this case. The heating was observed and reported, but too late to prevent the accident.

Conclusion

This accident was caused by a broken journal, due to overheating.

Respectfully submitted,

W. J. PATTERSON

Director.