Inv-2216

INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE

MISSOURI-KANSAS-TEXAS RAILROAD OF TEXAS

TROY, TEX.

OCTOBER 26, 1937.

INVESTIGATION NO. 2216

SUMMARY

Inv-2216

Railroad:	Missouri-Kansas-Texas of Texas
Date:	October 16, 1937.
Location:	Troy, Tex.
Kind of accident:	Derailment
Train involved:	Freight
Train number:	No. 81
Engine number:	851
Consist:	37 cars, caboose
Speed:	40 m.p.h.
Track:	0°34' curve; 0.681 percent ascending grade.
Weather:	Clear
Time:	11:40 p.m.
Casualties:	2 killed
Cause:	Probably top-heavy load with partially bound truck center casting and slightly irregular surface on curve.

Inv-2216

November 22, 1937.

To the Commission:

On October 26, 1937, there was a derailment of a freight train on the Missouri-Kansas-Texas Railroad of Texas near Troy, Tex., which resulted in the death of two trespassers.

Location and method of operation

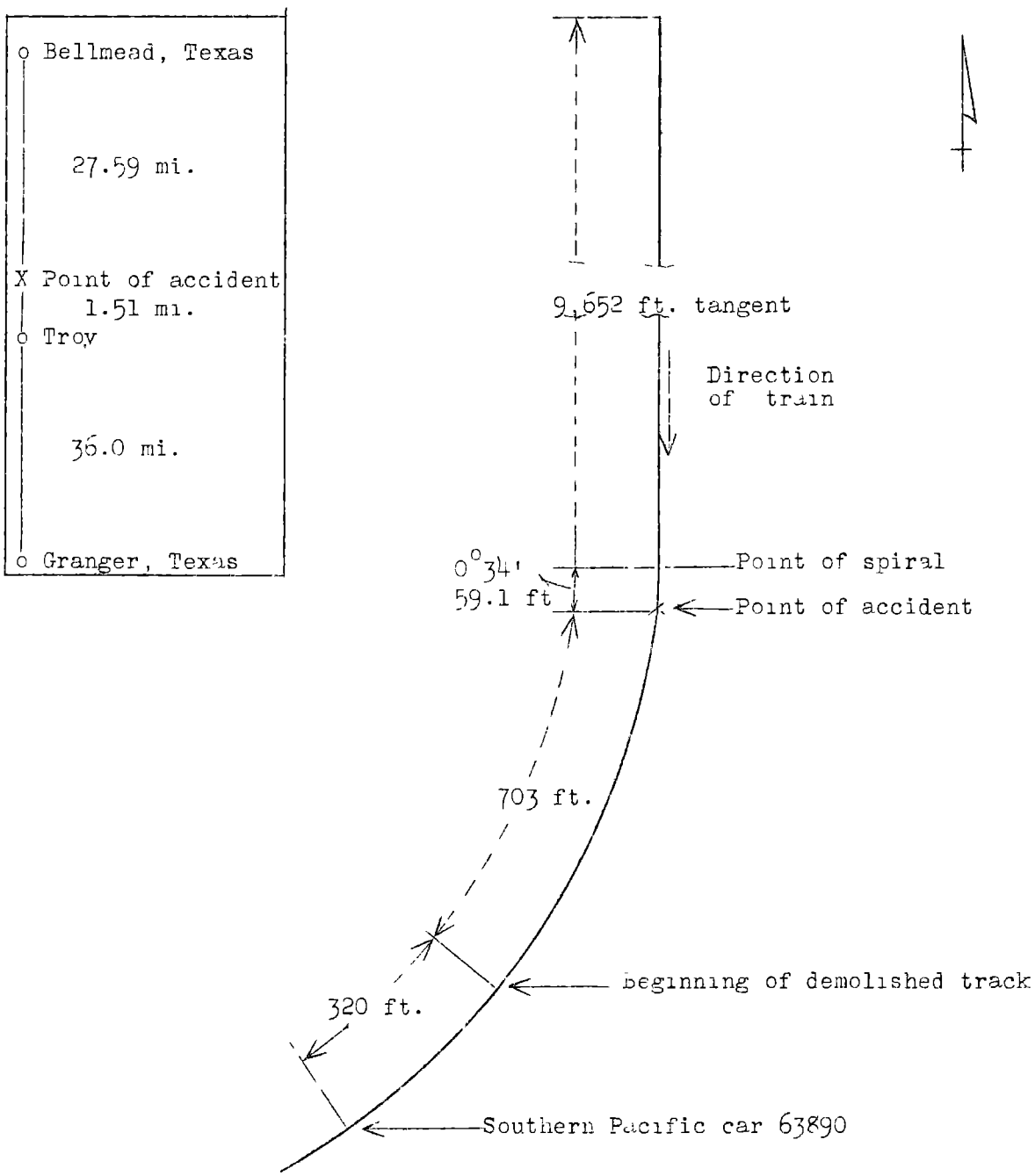
This accident occurred on that part of the San Antonio Division, which extends between Bellmead and Granger, Tex., a distance of 65.1 miles; in the vicinity of the point of accident this is a single-track line over which trains are operated by timetable, train orders and an automatic block-signal system. The derailment occurred at a point 1.51 miles north of the depot at Troy; approaching this point from the north the track is tangent for a distance of 9,652 feet, followed by a 2° curve to the right 1,759 feet in length; the derailment occurred on the spiral of this curve at a point 59.1 feet from its northern end where the curvature is 0°34'. The grade for south-bound trains is 0.297 to 0.922 percent descending for a distance of 10,400 feet, followed by 1,100 feet of level track and then 0.681 percent ascending a distance of 336 feet to the point of derailment and for a considerable distance beyond.

The track is laid on a 6-foot fill with 90-pound rails, 39 feet in length, with 24 ties to the rail length, single-spiked and fully tie-plated. The track is ballasted with crushed rock to a depth of 12 inches and is well maintained. The maximum authorized speed for the train involved is 40 miles per hour.

The weather was clear at the time of the accident, which occurred at 11:40 p.m.

Description

Train No. 81, a south-bound third-class freight train, consisted of 37 loaded cars and a caboose, hauled by engine 851, and was in charge of Conductor Turney and Engineman Hughes. This train departed from Bellmead, 27.59 miles north of the point of accident, at 10:48 p.m., according to the train sheet, 18 minutes late, and was derailed while traveling at a speed of about 40 miles per hour.



Inv. No. 2216
Missouri-Kansas-Texas
Railroad of Texas
Troy, Texas
October 26, 1937

The train parted between the fifteenth and sixteenth cars and a distance of 900 feet separated the two portions when both stopped. The engine and 13 leading cars were not derailed; the rear end of the fourteenth car stopped with the rear truck suspended 10 inches above the rails by the following car; the leading truck of the fifteenth car was derailed but remained on the roadbed while the rear end of the superstructure was down the embankment, and the rear truck lay about 580 feet north of the car and 50 feet east of the track; the sixteenth car stopped about 650 feet behind the fifteenth car, its trucks stopping about 500 feet farther north; the seventeenth car stopped at the foot of the fill on the east side of and 55 feet from the track at a point about 900 feet north of the fifteenth car; the six following cars skidded by the seventeenth car and were derailed in various positions along and across the track; the next seven cars were derailed and stopped in various positions within a space of 125 feet; the forward end of the thirty-first car was derailed to the right of the track while the rear end was near the rails; the thirty-second and thirty-third cars were derailed and stopped in line with the track; the last four cars and the caboose were not derailed. Nine of the derailed cars were destroyed and eight sustained considerable damage.

Summary of evidence

Engineman Hughes stated that the brakes were tested at Bellmead and that they operated properly en route. He made a service application of the brakes about 250 yards north of the point of derailment and released the brakes as the engine entered the curve; during this time he was using a drifting throttle. The speed was about 40 miles per hour when an emergency application of the brakes, originating in the train, gave him his first intimation of the derailment. He continued to work steam until the engine stopped. Engineman Hughes stated that he handled this train the same as other trains in the vicinity of the point of accident and he did not observe any irregularity in the track when entering the curve.

Fireman Brooks stated that he had fired for several enginemen over this territory and that Engineman Hughes handled the train in the usual manner. The fireman did not remember if a brake application was made coming down the hill preceding the point of accident. He did not observe any irregularity in the track in the vicinity of the north end of the curve and his first intimation of the accident was when the brakes were applied in emergency.

Conductor Turney stated that he was sitting at his caboose desk and the rear brakeman was sitting in the cupola approaching the point of derailment. The train was being operated in the usual manner and at a speed of about 40 miles per hour when he felt a sudden run-in of the rear end of the train and the rear brakeman applied the brakes in emergency. He estimated the rear end ran a distance of about three telegraph-pole spaces after the emergency application was made. The conductor made an inspection of the track and equipment after the accident occurred but did not arrive at any conclusion as to the cause.

Rear Brakeman Broughton stated that from his position on the west side of the cupola he observed a momentary flash of fire 18 or 20 car lengths ahead on the train; within a few seconds he saw a continuous stream of fire at which time he opened the air valve. He did not notice anything unusual in the handling of the train approaching the scene of the accident.

Head Brakeman Callahan stated that he was in the brakeman's cabin on top of the tender approaching the scene of the accident at a speed of about 40 miles per hour. He did not notice any irregularities in the track and said the train was handled as usual. As the engine entered the curve on which the accident occurred he saw sparks and fire about 12 or 13 cars back of the engine and almost immediately the brakes were applied in emergency.

Engineman Jones, Fireman Coats, Conductor Wadley and Brakemen Lee and Rogers, who comprised the crew of Train No. 70, the last train to pass the scene of accident prior to the occurrence thereof, stated that they did not observe any irregularities in the track at 8:30 p.m. when they passed that point.

Section Foreman Hood, who has charge of the section on which the accident occurred, stated that he last worked at the point of derailment during the last two or three days in September and he passed over this track during both the morning and afternoon of October 26. He arrived at the scene of the accident a few minutes after its occurrence and after looking at the track and equipment he came to no conclusion as to the cause of the derailment.

Roadmaster Smith, who arrived at the scene of the accident about five hours after its occurrence, stated that he examined the equipment and track in order to ascertain the cause of the derailment. He took cross-levels and the gauge of the track from the point of derailment to a point one-fourth mile north thereof; there were a few slight irregularities in the cross-levels and the gauge was almost perfect. The roadmaster did not determine the cause of the accident.

District Engineer Pruett arrived at the scene of the accident at about 9:00 a.m., October 28, and examined the track from the point of derailment northward a distance of 300 feet; the greatest variation in gauge was 5/16 inch and the alinement was good. The cross-level 300 feet north of the point of derailment showed the east rail to be 1/4 inch low and it continued low for a distance of four rail lengths southward where it reached a maximum of 1 inch and it was again level 2 rail lengths farther south; from this latter point the west rail was 3/8 inch low and it became lower at a uniform rate to the point of derailment where the west rail was 1-1/8 inches lower than the east rail, which is the proper elevation of the spiral at that point. He said the first indication of the derailment was on the east rail at a point 59.1 feet south of the north end of the spiral where two flange marks showed on the gauge side of the ball of the east rail and one of these marks continued diagonally across the top of the rail for a distance of 21 feet; the second flange mark appeared at a point 1.2 feet south of the first one and continued diagonally across the top of the rail a distance of 23.3 feet. One flange mark appeared on the outside of the base of the rail for a distance of 2.8 feet while the other mark continued 3.4 feet farther south; then flange marks appeared on the ends of the ties. Corresponding flange marks 5 1/2 inches inside of the west rail appeared opposite the point where the flange marks appeared on the outside of the east rail and these marks continued for a distance of 556 feet where the outside marks ran off the ends of the ties and the marks in the center of the track indicated that a truck apparently had slued and was dragged in that position 147 feet, turning the rail out; from this latter point the track was destroyed for a distance of 177 feet. South of the destroyed section, flange marks appeared on the east side of the track on the ends of the ties for a distance of 71 feet and then for the next 869 feet marks indicating something had been dragging appeared on the east ends of the ties and continued to the point where the fifteenth car stopped. He was unable to determine definitely which was the first car to be derailed but there was a preponderance of evidence indicating that it was the seventeenth car, S. P. 63890. The forward truck of this car stopped about 10 feet north of the car and considerable dirt, ballast and splinters were banked against the right side of the wheels; both wheels on the rear axle of this truck had shifted inward on the axle a distance of about one inch. A further examination of the flange marks on the ties indicated that the wheels had shifted as a result of the derailment; however, there was heavy wear apparent and slight abrasions on the inside of the flanges of both wheels which indicated to him that the wheels might have been slightly shifted on the axle, causing the inside of the flanges to strike guard rails and flange-ways of frogs more severely than if the wheels had been of standard gauge.

Wrecking Foreman Calloway stated that he arrived at the scene of the accident about 5 hours 30 minutes after its occurrence. He saw the flange marks on the rails and ties as described by the district engineer. The wrecking foreman inspected the leading truck of Milwaukee 503111, the fifteenth car in the train, and found one wheel flange cut almost to the tread caused by dragging on a rail. He also inspected both trucks of S.P. 63890, the seventeenth car, and found that the top and bottom center plates were dry and the only evidence of grease was in the corner and around the edge where there was a dust accumulation. The center plates on the south end of this car did not have full bearing at the seat; on right-hand side of top or male center plate the flange of bottom center plate had worn on the flange section of the top center plate next to the boss and there was no indication of a full flat bearing on the boss section of top center plate. The R-2 wheel was found to have shifted inward on axle one inch and the L-2 wheel had shifted inward 1-3/16 inches but he believed these wheels shifted as a result of the derailment; it required 45 and 55 tons pressure, respectively, to move them when subsequently tested in the shops, while it required 98 and 55 tons, respectively, to move the other pair of wheels on this truck. It was the opinion of the wrecking foreman that, due to car S.P. 63890 being loaded to its top with Fuller's earth, which made it slightly top heavy, combined with possible slack action in the train, this car was the first to become derailed. Shop Superintendent Webster corroborated the statement concerning the pressures required during the tests and added that it usually required about twice the pressure to start a wheel from its seat as that required by the wheel fit.

Car Foreman Gillen stated that he arrived at the scene of the accident about five hours after its occurrence and after making observations it was his opinion that the fifteenth car was the first to be derailed which he thought was caused by slack action in the train.

Superintendent Dobbins stated that after he made an inspection of the track and equipment at the scene of the accident it was his opinion that car S.P. 63390 was the first to be derailed for the reason that this car was top heavy, and the truck was somewhat center bound; slack action in the train may have been a factor in the derailment.

Trainmaster Davidson, who arrived at the scene about three hours after its occurrence, stated that after inspecting the track and equipment it was his opinion that the fifteenth car was the first to be derailed for the reason the rear end of the fourteenth car was suspended above the rails about 18 inches and the front truck of the fifteenth car was astride the east rail, the east front corner of this car resting on the leading truck;

the rear end was down a 6-foot embankment which indicated that it was shoved to that position by the following cars; the left front side bearing was rusty while the right front bearing was very bright which indicated considerable wear; the right front corner of filler-block housing indicated that the bearing was fouling the housing; the flange marks on the rail as well as on the ties indicated possibility of the bearings fouling and causing the wheels to mount the rails on the spiral of the curve. The trainmaster said that if the fifteenth car was not the first to be derailed, then in his opinion it was the seventeenth.

Observations of the Commission's inspectors

Car S. P. 63890, the seventeenth car behind the engine, which was loaded to the roof with 102,600 pounds of sacked Fuller's earth, was inspected by the Commission's inspectors with the results as set forth below:

Type	All-steel automobile
Built	4-16-37
Capacity	100,000 pounds
Load limit	118,700 pounds
Light weight	50,300 pounds
Length, buffer block to buffer block	41 feet 8 inches
Inside length	40 feet 6 inches
Inside width	9 feet 2 inches
Inside height	10 feet 4 inches
Top of rails to decking	3 feet 5-1/2 inches
Trucks	Bettendorf without spring plank
Wheels	33 inch, cast iron
Bottom side bearings	Plain block pocket type, flat metal bearings, unsecured; pockets 4-3/8" x 10-1/2", 1-5/16" deep
Spacing of side bearings	50 1/2 inches
Boss on top of center plate	1-1/2 inches high
Depth of truck center plate	1-5/16 inches

The boss on top center bearings was of the taper type; both trucks were cutting and there was no evidence of lubrication. The center bearing seats showed evidence of uniform contact which indicated the flanges of the bolster bearings carried most of the weight. The bolster bearing blocks were missing but the pockets showed evidence they had been in place recently.

The R-2 and L-2 wheels were found shifted on the axle; the tests involved in pressing the wheels off of the axle were observed and the results were as stated by the shop superintendent.

The first indications of the derailment were two flange marks on the gauge side of the ball of the outside rail of the curve; these marks indicated the left wheels of a truck rocked down upon the ball of the rail and then continued to travel diagonally across the rail a distance of about 21 feet and then flange marks appeared on spike heads and on the ends of the ties; companion marks appeared on the inside of the west rail from the point where the wheels dropped to the outside of the east rail.

Discussion

The evidence indicates that the front truck of the seventeenth car, S. P. 65890, was the first to be derailed; this truck apparently ran approximately parallel with the rails a distance of 630 feet and then it began to slue crosswise the track, turning the left rail over, followed by the derailment of the rear truck. The front truck continued in this position to a point about 703 feet south of the point of derailment where it began to bunch and tear out the ties, shoved left rail from ties, and then demolished the track for a distance of 177 feet. The car then turned over to the left and stopped at the foot of the 6-foot embankment, carrying the rail with it; this pulled the sixteenth car down the fill which in turn pulled the fifteenth car down and derailed the rear truck of the fourteenth car. Apparently the leading truck of the seventeenth car slued to the left since the ballast was banked against the outside of the west wheels and the inside of the east wheels; also, the right-front journal box appeared to have been dragged practically crosswise the track and where this truck dropped off the rail the inside of the west-side frame appeared to have chafed the right or west rail some distance; this was the only truck showing such evidence. In addition the demolished track did not extend south of the point of where the seventeenth car stopped. South of the car in question flange marks appeared on the ends of the ties on the east side for a distance of 71 feet and from this latter point to the location of the fifteenth car, a distance of about 750 feet, only the left ends of the ties were scraped. It appeared that during the derailment the two wheels on the rear axle of the leading truck of the seventeenth car were shifted inward on the axle, and indications that the truck side had sustained a severe blow provided an explanation of this movement.

There was some evidence pointing to the fifteenth car being the first to be derailed. A groove was cut in the flange of the left-front wheel of the front truck of this car which indicated that it had been chafing the outside of the ball of the left rail while in a diagonal position. It appeared that this truck had

been dragging over the east ends of the ties but there was no evidence on the west-side frame or on the wheels that it had been dragging through ballast crosswise the track; however, there was evidence that the rear truck had slued as it had dirt and ballast banked against the inside of the left wheels but there was no indication on the west side frame or west wheels that they had been dragging crosswise or diagonally across the track. There was evidence that the west side frame of the rear truck had been struck or run over while in a diagonal position.

The fact that the engineman worked steam after the derailment started, accounts for the sixteenth car being dragged a considerable distance ahead of the seventeenth car.

There was no evidence to indicate that slack action in the train contributed to the cause of this accident. The speed of the train at the time of the accident, according to the evidence, was not in excess of that authorized. There were slight irregularities in the cross-levels of the track immediately north of the point of accident which may have started the cars to rocking and in the case of the seventeenth car which was loaded to its full cubical capacity the rocking may have become excessive.

Conclusion

The derailment was probably due to a combination of a top-heavy load and a partially bound truck-center casting in the seventeenth car in the train in conjunction with slight irregularities in the track.

Respectfully submitted,

W. J. PATTERSON,

Director.