

## INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE  
INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE  
CHICAGO, ROCK ISLAND & PACIFIC RAILWAY AT KREMLIN,  
OKLA , ON SEPTEMBER 12, 1930.

October 22, 1930.

To the Commission:

On September 12, 1930, there was a derailment of a freight train on the Chicago, Rock Island & Pacific Railway at Kremlin, Okla., which resulted in the death of four trespassers.

Location and method of operation

This accident occurred on Subdivision 45 of the Second District of the Oklahoma-Southern Division, which extends between Caldwell, Kans., and El Reno, Okla., a distance of 108.3 miles, and is a single-track line over which trains are operated by time-table and train orders, no block-signal system being in use. The derailment occurred near the east switch of a passing track, 793.4 feet east of the station, although the first marks of derailment appeared at the west house-track switch, located 1,741.7 feet west of that point. Approaching the scene of accident from the west, the track is tangent for more than  $1\frac{1}{2}$  miles, this tangent extending for a considerable distance beyond the final point of derailment. The grade is generally descending for eastbound trains, and is 0.15 per cent from the initial point of derailment to the final point of derailment. The house track, 1,471.7 feet in length, parallels the main track on the north, and the passing track, 4,993.4 feet in length, parallels the main track on the south.

The track is laid on a slight fill, with 110-pound rails, 39 feet in length, with an average of 23 treated hardwood ties to the rail-length, and is single-spiked, fully tie-plated, and ballasted with burnt gumbo to a depth of about 13 inches. The track is well maintained. The maximum speed permitted by time-table on tangent track for trains handling loaded tank cars is 35 miles per hour.

The weather was clear at the time of the accident, which occurred about 11.37 a.m.

### Description

Eastbound second-class freight train first No. 98 consisted of 76 loaded cars, most of which were tank cars, and a caboose, hauled by engine 5039, and was in charge of Conductor Dillon and Engineman Coley. This train departed from Enid, Okla., 11.1 miles west of Kremlin, at 11 10 a.m., according to the train sheet, one hour late, and was derailed at Kremlin while traveling at a speed estimated to have been about 35 miles per hour.

Twenty-one cars in about the center of the train were derailed, the thirty-eighth car was derailed but remained coupled to the head portion of the train and came to rest 2,130 feet beyond the wreckage. The thirty-ninth to the fifty-seventh cars, inclusive, were piled up within a distance of approximately 230 feet, and were demolished, while the contents exploded and burned. The following two cars were derailed, but remained in an upright position, slightly damaged, approximately 150 feet west of the main portion of the wreckage, and coupled to the rear portion of the train. None of the other cars was derailed or damaged. The rear truck of the thirty-eighth car was demolished, the lead wheels of this truck remained on the rails, and the rear wheels were buried in the wreckage. There were several buildings adjacent to and on each side of the track which were destroyed by fire.

### Summary of evidence

Engineman Coley stated that approaching Kremlin he reduced the speed slightly and after releasing the air brakes he worked a light throttle and had attained a speed of about 35 miles per hour when he felt a slight jerk in the train. He looked back on his side of the cab and could see nothing, but both the fireman and brakeman were looking back on the left side and said to stop the train, as it appeared to them that the station was being torn down. Engineman Coley could see only a little dust on his side, so he rushed over to the other side and looked back and saw a fire break out. He then went back to his own side of the cab, placed the brake valve in full-release position, and opened the throttle, attempting to pull the forward part of the train as far away as possible. Engineman Coley further stated that when approaching Kremlin, he

had looked back over his train several times, as also did the fireman and brakeman, and that they passed some sectionmen, also west of Kremlin; he noticed that these men looked the train over as it passed, but they did not give him any stop or slow signals. The air brakes had been tested at El Reno, the initial terminal, and they worked properly en route, and at no time was the train uncoupled, while the train crew inspected the train at Enid, their last stop, and the head brakeman said that everything was all right.

The statements of Fireman Gholston corroborated those of Engineman Coley, adding, however, that after having passed the station he looked back, saw that something was wrong, and saw several trespassers on the train signaling them to stop; these signals were the only ones that he had seen at any time. Fireman Gholston also stated that he went back to the west house-track switch and saw marks that indicated a broken truck had struck the switch.

Head Brakeman Sadler stated that as they entered Enid Yard he got off the engine on the engineman's side and looked the train over as it pulled by, the train stopped after 50 or 55 cars had passed him, and he then crossed over to the other side and walked back to the engine, inspecting the cars as he went along for any defects in the running gear, such as brake beams down, hot boxes, broken arch bars, and missing or broken bolts, he said that he saw nothing wrong with any of the cars. After the accident, he went toward the rear and saw that the rear end of the thirty-eighth car had only one pair of wheels under it and that the truck was missing. Brakeman Sadler said he found the journal box of the broken truck of this car lying 10 or 12 feet from the track, at a point about six or seven car-lengths west of the station, and he also saw a journal-box bolt lying near the ties, this bolt had one end cut off and it appeared to be a fresh cut.

Conductor Dillon was riding in the cupola of the caboose on the left side, and said everything seemed to be all right when the engineman whistled for Kremlin, but after passing the west passing-track switch, the conductor saw a big cloud of dust, apparently near the middle of the train, which at that time was opposite the station. He immediately pulled the air and the rear portion of the train came to a stop with the caboose at the station. He made an inspection of the track and found a journal box west of the station, a broken box bolt lying along the track, and a short piece of the bottom of a tie strap.

There were marks on about eight ties east of the west house-track switch, and it was his opinion that the truck broke down and portions of it became entangled with the stock rail leading to the house track, gradually pulling the truck to the left and resulting in the derailment. Conductor Dillon stated that he received a proceed signal from the car inspector upon leaving Enid, this man having watched the train as it departed, and he also received a similar signal from section men as the train passed them about 3 or 4 miles west of Kremlin.

Rear Brakeman Burkhalter stated that approaching Kremlin he went out on the rear platform of the caboose, and as they passed the west house-track switch he saw wheel marks on the ties and called to the conductor that a car was on the ground, but the conductor had already applied the brakes. Brakeman Burkhalter went back a distance of about 3/4 mile to flag, and saw no marks on the track west of the house-track switch.

Car Inspector Garrett stated that he thought the car involved, GATX 2742, came into El Reno Yard in extra 3026, but the rear portion of that train was switched to another track before they had inspected any of the oil tank cars, a blue flag not having been placed on the train upon arrival, as required. He thought, however, that he afterwards inspected the car in question, together with others that were to be placed in train No. 98. During the course of this inspection, he tightened several journal-box bolts but made no record of it, and he could not say definitely that the car was inspected at all, as the only time a record is made is when repairs are necessary. He went off duty before train No. 98 was made up, so did not know whether a complete inspection was made before its departure. Car Inspector Garrett had about a year's experience as car inspector during the last 13 years, and had been working in this yard only a few days, but said he was fully aware that loose and missing oil-box and column bolts and nuts created a dangerous condition and that he inspects carefully for such defects.

Night Chief Car Inspector Biggett stated that the reason extra 3026 did not receive a complete inspection, and also have a blue flag placed on it, was because the yardmaster told him this train had some gasoline cars for train No. 95 and wanted them handled immediately, the inspection to be made subsequently, and he was positive that the cars for train No. 98 were so inspected. He said that it is customary to keep a record of loose bolts found on cars, but that he had failed to instruct

Inspector Garrett to that effect; however, he had cautioned him about tightening all loose bolts and nuts. In addition to the inspection force, there are four oilers who go over trains and report anything wrong that they find, and he was sure that if there had been any loose or missing bolts on GATX 2742, these men would have found and reported them.

Car Inspectors Hamburger and Brungard assisted in making an inspection of the cars that were to make up train No. 98, and they said some slight repairs were made, but no record was kept. They stated that train No. 98 was mechanically all right when it departed from El Reno.

Car Inspector Lynch, of Enid, Okla., stated that as train No. 98 departed from Enid he gave it a running inspection on the fireman's side, and he did not see any defects except that one column bolt nut was missing on a tank car, which he did not think was serious enough to report, and he gave the conductor a highball as the rear end of the train passed him.

Section Foreman Landon, who was working with his men about 3 miles west of Kremlin on the day of the accident, stated that the customary running inspection was made of train No. 98 as it passed, the section men standing on the fireman's side and he himself on the engineman's side, no defects were noticed and he signalled the rear brakeman accordingly after the caboose had passed him. After the accident, he inspected the marks of derailment at the house-track switch and examined the parts of the truck involved, and was of the opinion that the journal-box bolt sheared off, letting the arch bar drop down until it caught the stock rail on the west house-track switch, the tie bar was first to hit the rail and slipped over it, and the column-bolt nut caught the rail and pulled the wheels over the main track rail.

General Car Foreman Pearre stated that the journal-box bolt that failed was found to have been sheared near the top of the bolt, at the point where the top and bottom arch bars fitted together, and it appeared to have been a clean cut; the bottom of this bolt was sheared off at about the top of the nut which fits on the bottom of the bolt, this, however, showed some wear, and was not as clean and complete a cut as the one at the top of the bolt. He gave it as his opinion that the arch bar

gathered the force to shear this bolt from the wear on the bolt and wear in the top journal-box hole that this bolt went through, as well as the wear of the bottom journal-box hole and the hole in the tie strap, all of this wear allowing enough play so that the spring motion of the truck caused the two arch bars to act as a pair of scissors on this bolt.

The statements of District Car Inspector McBrian substantiated those of General Car Foreman Pearre relative to the wear of the bolt and bolt holes. This car had been in the car shop in July, 1930, and he did not think that these parts could have become so badly worn in the short time since that date. He was of the opinion that at the time of the train inspection at El Reno, the arch bars might have been in a strained position, with the result that the bolt was held tightly for the time being. The other bolt of this journal box was missing, and he was unable to explain its absence except to say that he thought it must have been in the wreckage; he walked back from Kremlin to Enid, but was unable to find it.

Examination of the track showed that the first mark of derailment was on the north or stock rail of the turnout at the west house-track switch at a point 10 feet 10 inches east of the switch point, and that it continued for a distance of 11 feet 5 inches. It appeared to have been caused by a bolt or some piece of metal dragging along the outside edge of the ball of the rail and extended downward about 1/2 inch from the top of the rail, at the end of this mark there was another mark which covered the entire outside edge of the ball of the rail and continued for a distance of 22 feet 10 inches. No other marks appeared on the turnout rail. The first flange mark appeared on top of and near the gauge side of the north rail of the main track, 24 feet 9 inches east of the switch point, and it continued for a distance of 4 feet 3 inches to where the wheel ran off the outside of the rail, there was a similar mark on the same rail 6 feet 8 inches east of where the first mark ended, and it extended for about the same distance as the other mark. A mark then appeared on top of the ball of the south main track rail, starting 29 feet 2 inches east of the switch point, and it appeared to have been caused by a wheel skidding across the rail. A flange mark then appeared on the tie plate on the inside of the south main track rail, 32 feet 10 inches from the point of switch. Flange marks were found on 16 of the following 24 ties, and in some places marks appeared on the north side of each rail. A flange apparently struck the guard rail, dislodging it, and the flange on the opposite side rode over the frog lugs and lug sleeves, breaking all of them. From the end of the guard rail, the heads of the spikes were marked for a distance of 14 feet 7 inches, and on

all ties north of this point there were flange marks on the inside of the south rail. Beyond the frog on the north rail, there were flange marks on the heads of the spikes for a distance of 17 feet 8 inches. At this point, 106 feet 8 inches from the switch point, and continuing eastward to the frog at the east end of the house track, the north ends of all ties were badly damaged, caused by some heavy object striking and dragging across them, this heavy object, presumably an arch bar, when encountered the frog and the wheels were diverted to the right or south, damaging the track and resulting in the derailment of the following cars.

The front journal box on left side of rear truck of the thirty-eighth car, GATX 3742, was found approximately 670 feet east of the west house-track switch, and about 30 feet from the north rail of the main track, it was not damaged. One of the journal-box bolts was found on the ends of the ties, 6 rail-lengths east of the west frog of the house track. The left truck side of the rear truck was found approximately 1,465 feet east of the west house-track switch and approximately 40 feet from the north rail, while the right truck side and truck bolster were found approximately 780 feet farther east, lying outside of and close to the right or south rail. This car was equipped with trucks of the arch-bar type, with the top arch bar of  $1\frac{1}{2}$ " x  $4\frac{1}{2}$ " material; bottom arch bar of  $1\frac{3}{8}$ " x  $4\frac{1}{2}$ " material, and a  $\frac{5}{8}$ " x  $4\frac{1}{2}$ " tie bar, and had a capacity of 80,000 lbs. The bottom arch bar on the left side of the rear truck was not riveted to the top arch bar, over the journal boxes, as was the case with the bottom arch bar on the right side. The bolt found near the track after the accident was  $13\frac{1}{4}$  inches in length, whereas it should have measured 17 or  $17\frac{1}{2}$  inches, and it appeared to have been sheared off  $1\frac{1}{2}$  inches from the top. This bolt showed wear both at the top and the bottom, and it is believed that this bolt was in the rear holes of the journal box, and that the bolt in the forward holes was not found, although search was made from the point of accident as far back as Enid, 11.1 miles from Kremlin. There was no evidence of the material of this bolt having been defective, the ends being cut off smoothly. The threaded end was badly worn, only about  $\frac{5}{8}$  inch of metal remaining where the bolt went through the tie bar.

Inspection also disclosed that the forward end of the tie bar of the rear truck was marked for  $1\frac{1}{8}$  inches, beginning at the outside edge. This mark was very distinct and appeared to have been caused by the tie bar striking against some hard object; the tie bar was then bent downward and backward until it broke off at the inner bolt holes of the journal box. There was

some wear in this tie bar at the front side of the front oil-box bolt hole, and there were signs of considerable wear on the underside of the tie bar around the bolt hole at the forward end of the tie bar, apparently caused by looseness between the bolt nut and the tie bar. The bottom and top arch bars were bent upward. The bottom ends of the column bolts were badly marked, evidently caused by rubbing against the rails and striking the outside ends of the ties, and also coming in contact with the frog; the truck side columns were broken, but the column bolts were not broken. There were signs of looseness between the bottom and top arch bars, at the forward ends of these two bars. The sand board of this truck was marked near the left side, and had the appearance of having been dragged along the top of the rail for a considerable distance. The right truck side was not badly damaged.

#### Conclusions

This accident was caused by the failure of an arch-bar truck.

The investigation disclosed that a bolt on the forward journal box of the rear truck of the thirty-eighth car had been sheared off, the journal box was found approximately 670 feet east of the west house-track switch and one of the box bolts was found 6 rail-lengths east of the house-track switch, while the other bolt was not found. The bottom of the bolt was badly worn, and the remaining portion, which measured approximately 5/8 inch in thickness was sheared off cleanly. This allowed the tie bar to be in a loosened condition and the vibration of the car caused it to move up and down under the oil box until finally it got so low that the extreme outer edge of the front end of the tie bar came in contact with some part of the switch, bending this forward portion of the tie bar back under the truck, which in turn caused the two arch bars to get sufficient play to enable them to act as a pair of scissors on the top of this journal box bolt, shearing it off. It seems probable that this in turn resulted in the dropping of the truck side until the forward column bolt nut fouled the stock rail of the turnout to the house track and followed that rail until it pulled the flange of the left wheels over the rail and in turn pulled the arch bars off of the journal box, finally pulling the spikes and causing this stock rail to be turned over, this rail turning over allowed the truck frame to spring back to the main track and follow the main track at the outside edges of the ties, cutting them badly, until it came in contact with the frog



at the east end of the house track, where it lodged and caused the derailment of the following cars.

The testimony disclosed the fact that some repairs were made on cars in this train, such as tightening the nuts on journal box bolts, but no record was made. It is not known whether or not any of those repairs were made on the car involved, and, in fact, it is not certain whether this particular car was inspected prior to departure of the train from its terminal.

There was only one box bolt found after the accident, although diligent search was made to locate the other bolt, and in view of the fact that the usual practice followed in inspection was not followed in this instance, it is possible that the missing box bolt was not in place at the time this train departed from the terminal.

With trucks of this type it is necessary as a safety measure that journal-box bolts be in good condition and be kept tight. The worn condition of the journal-box bolt which was recovered and marks on the arch bar indicated that this bolt had been loose for a considerable period prior to the accident. This accident directs attention to the need for increased care and vigilance in inspection of equipment of this character.

All of the employees involved were experienced men with the exception of Car Inspector Joseph Garrett, who had only about one year's experience and at the time of the accident he had been working in the El Reno yard only a very short time. None of the employees had been on duty in violation of any of the provisions of the hours of service law.

Respectfully submitted,

W. P. Borland,

Director.