

BUREAU OF SAFETY

REPORT NO. 1971

Railroad:	Missouri Pacific
Date:	February 25, 1935
Location:	Cunningham Spur, Ark.
Kind of accident:	Derailment
Train involved:	Freight
Train number:	96
Engine number:	1244
Consist:	17 cars and caboose
Speed:	35-45 m.p.h.
Track:	Tangent and level
Weather:	Sleet
Casualties:	1 killed and 1 injured
Cause:	Broken arch bar on eleventh car.

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING
AN ACCIDENT ON THE MISSOURI PACIFIC RAILROAD AT
CUNNINGHAM SPUR, ARK., ON FEBRUARY 25, 1935.

April 22, 1935.

To the Commission:

On February 25, 1935, there was a derailment of a freight train on the Missouri Pacific Railroad at Cunningham Spur, Ark., which resulted in the death of 1 trespasser and the injury of 1 trespasser.

Location and method of operation

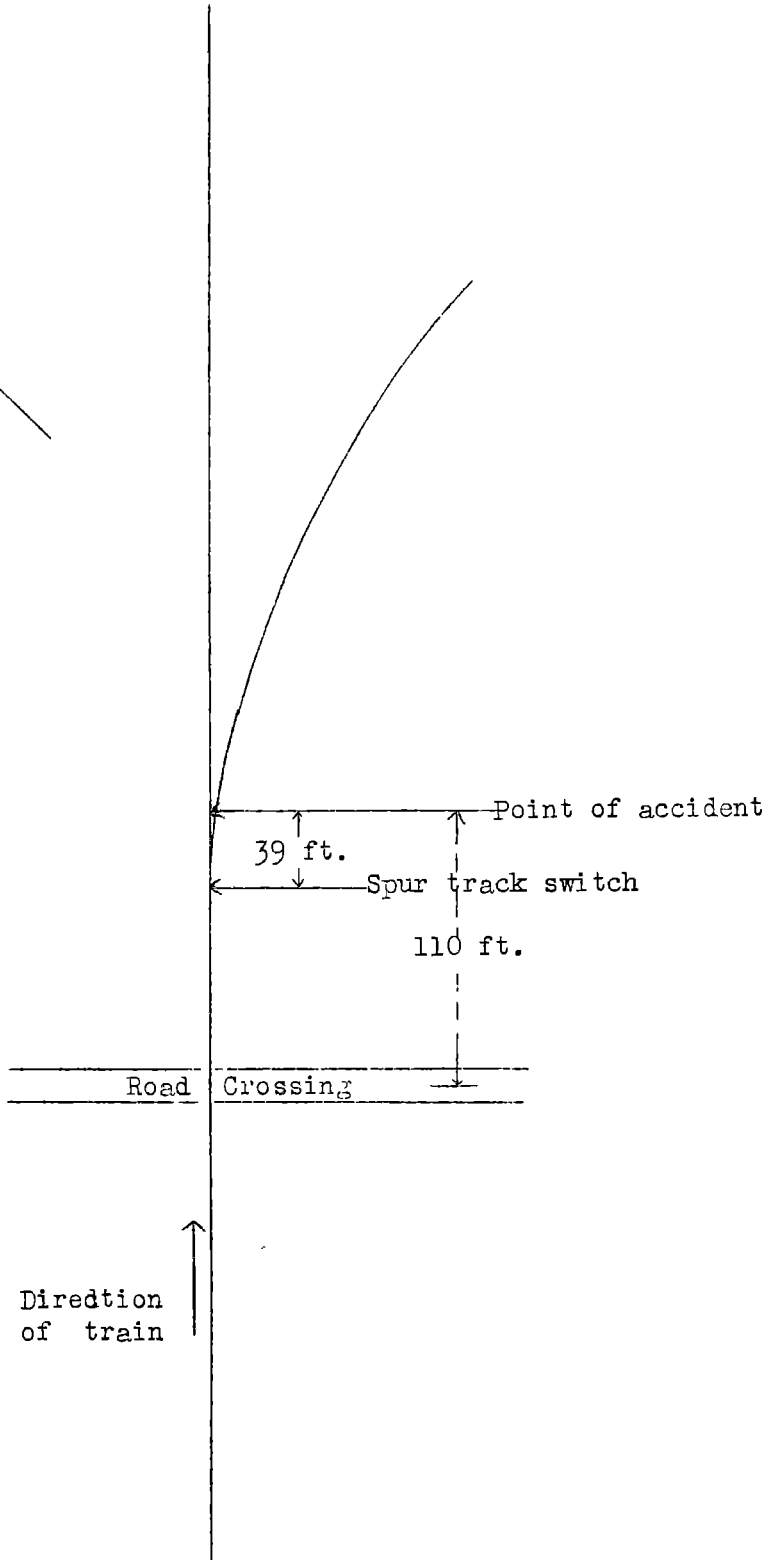
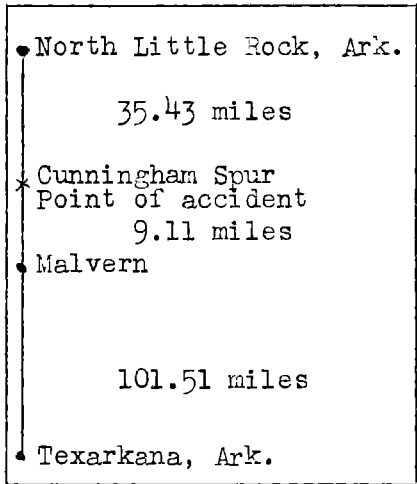
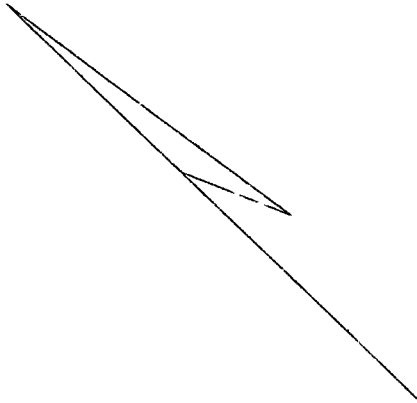
This accident occurred on the Little Rock District of the Arkansas Division, which extends between North Little Rock and Texarkana, Ark., a distance of 146.05 miles. In the vicinity of the point of accident this is a single-track line over which trains are operated by time table, train orders, and an automatic block-signal system. The accident occurred just north of the facing-point switch leading to a spur track known as Cunningham Spur; approaching the point of accident from the south, the track is tangent for approximately 3 miles, this tangent extending for a considerable distance farther north. The grade is level at the point of accident.

The track is laid with 90-pound rails, 39 feet in length, with an average of 24 ties to the rail length, single-spiked, tie-plated, and ballasted with gravel to a depth of about 18 inches. The maximum permissible speed for freight trains is 45 miles per hour.

The weather was cloudy and it was sleeting at the time of the accident, which occurred at 4:05 p.m.

Description

Train No. 96, a north-bound third-class freight train, consisted of 14 freight cars, 1 combination mail and baggage car, 2 baggage cars, and a caboose, hauled by engine 1244, and was in charge of Conductor Griffin and Engineman Moore. This train left Malvern, the last open office, 9.11 miles south of Cunningham Spur, at 3:45 p.m., according to the train sheet, 3 hours and 33 minutes late, and was derailed at Cunningham Spur while traveling at a speed estimated to have been between 35 and 45 miles per hour.



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The rear truck of the eleventh car, the twelfth to the sixteenth cars, inclusive, and the front truck of the seventeenth car were derailed, the eleventh car stopping about 465 feet north of the switch, while the engine and first 10 cars broke loose and stopped about 15 car lengths farther north. The twelfth car stopped on its right side to the right of the track, while the thirteenth car passed this car and remained in an upright position across the track; the fourteenth car turned over on its right side just beyond the twelfth car and the fifteenth car turned over on its left side, while the remaining cars remained in general line with the track. The fourteenth car was loaded with gasoline which became ignited, four of the cars being burned and two badly damaged.

Summary of evidence

Engineman Moore stated that the speed of his train was about 40 miles per hour when he felt a jerk in the train and on looking at the air gauge he saw the pressure drop; he then looked back and saw one of the cars on fire. He had noticed no unusual rocking of the engine en route and had looked back over his train frequently. The air brakes had been tested at Gurdon and were reported to be in working order. The statements of Fireman Johnson corroborated those of the engineman.

Conductor Griffin stated that after the derailment he inspected the derailed equipment and track; he found a bright mark on the ball of the turnout rail, indicating that something had rubbed along it, and he was of the opinion that bolts or something had dropped down and caught the rail and pulled a truck off the rails. The rear truck of the first derailed car, the eleventh car in the train, had become detached and was buried in the ditch, although he could not get to it. This car was one of the seven cars that had been picked up at Arkadelphia, 31 miles south of the point of accident; he had inspected these cars at that point and found nothing wrong; if there had been a broken arch bar he thought he would have seen it. He further stated that he noticed no unusual track conditions between Malvern and the point of accident.

As the train pulled out of the passing track at Malvern, Head Brakeman Nash was standing on the right side and observed the entire train as it passed him, but saw nothing wrong; he then rode in the caboose to the point of accident.

Middle Brakeman Edwards and Rear Brakeman Ransom, who were in the cupola of the caboose, stated that the first intimation they had of anything wrong was when the brakes

were applied in emergency and they saw the cars being derailed. Brakeman Edwards stated that the cars picked up at Arkadelphia were inspected by him on the right side, and Brakeman Ransom stated that he looked them over on both sides, but nothing wrong was found. Marks on the track indicated that something had been dragging, and Brakeman Ransom was of the opinion there was a broken arch bar.

General Car Inspector Dysart stated that he found the top and bottom arch bars broken on the right side of the rear truck of MP gondola 68733. Both breaks appeared to be entirely new, although the break in the bottom bar was a clean break while the break in the top bar showed the metal had been pulled and torn, indicating that the bottom bar snapped but that the top bar was broken as a result of the accident. A column bolt and nut had been sheared off at the bottom edge of the tie bar and a box bolt nut was missing. The indentation on the nut of the broken column bolt indicated that it had come in contact with an angle bar. The other box bolts and column bolts were in good condition and the broken column bolt had been tight and in good condition prior to the accident. Examination of the track disclosed a mark in the dirt on the right side of a road crossing located 71 feet south of the spur switch; the next mark was on the outside of the stock rail and indicated that something had been dragging on the outside of the ball of the rail; this was followed by a mark on an angle bar, about 18 feet beyond, at which point there was a mark diagonally across the top of the rail where something had passed over it. On the left rail opposite this point there was a mark indicating that something had been sliding off the top of the rail, and about 18 inches beyond there were wheel marks which appeared on the ties; these marks continued to a point where the track was torn up. The dimensions of the top arch bar were $1\frac{1}{2}$ by 5 inches and the bottom arch bar $1\frac{3}{4}$ by 5 inches, and Mr. Dysart said that in case of renewal the top arch bar would have to be $1\frac{3}{4}$ inches in order to comply with Missouri Pacific standards.

Car Inspector Gates stated that he inspected all the cars in Train No. 96 before its departure from Gurdon on February 23, the second day prior to the accident, which inspection included MP 68733, and while he did not remember this particular car he made a careful inspection of the trucks and used a mirror when inspecting arch bars, but he did not find any defective arch bars in the train. He further stated that he had found many defective arch bars in cars of the 68000 series.

Roadmaster Cranford stated that soon after his arrival at the scene he inspected the track for more than 1 mile south of the point of accident; he instructed the section foreman to go back over the track as far as Malvern that evening and made a personal inspection of the track on the following day for a distance of 8 miles, within which territory there were three switches with turnouts on the right side and several road crossings. No marks were found indicating dragging equipment except at the road crossing just south of the Cunningham Spur switch. At this point there was a furrow in the gravel on the outside of the right rail, about $9\frac{1}{2}$ inches from the gauge side of the rail and about 7 or 8 inches in width and 18 inches in length; the next mark was on the outside of the ball of the stock rail commencing about 15 feet from the switch point and continuing to an angle bar, 33 feet from the switch point; this angle bar had been struck by something and the stock rail was pulled in toward the main track, and Roadmaster Cranford was of the opinion that the wheels were pulled off the rails at that time. The first wheel mark on the ties appeared on the west side on the twenty-second tie or 39 feet north of the switch point; this mark appeared on the following ties to the thirty-seventh tie, where two marks appeared. These marks then ran diagonally across the track until they reached the east rail on the eighty-ninth tie, and beyond that point the track was torn up for a distance of 268 feet.

Inspection of the track by the Commission's inspectors for a distance of 1 mile south of the point of accident showed no indication of dragging equipment except at the road crossing just south of the point of accident, and in addition to the marks found at the point of accident as previously described, their inspection disclosed a flange mark on the right or east side of the track on the twenty-fifth tie, about 9 inches from the gauge side of the rail, this mark continuing on the ties to a point where the wheel crossed the turnout portion of the frog and then swerved to the right and off the ends of the ties. The burr on the end of the angle bar matched with the dent in the column-bolt nut which was found $3\frac{1}{2}$ feet south and 16 feet east of the angle bar.

Inspection of the rear truck of MP 68733 disclosed that the top bar was broken at the front column-bolt hole and the bottom bar was broken at the bend, about 3 inches from the center of the rear hole of the front journal box; both breaks were fresh. The end of the front column bolt had been sheared and broken off flush with the bottom of the tie bar, the end of the bolt together with the nut and grip nut being found in the vicinity of the point of accident. The nut and grip nut were missing from the front journal-box bolt, but the other

bolts were intact and tight, and from the appearance of the broken column bolt and nut it had been tight prior to the accident. The ends of the top arch bar fitted snugly to the lips of the bottom bar, and there was but little wear in the column and journal-box bolts. This car is a gondola, built in February, 1917; it has a capacity of 100,000 pounds, with a light weight of 41,500 pounds and a load limit of 127,500 pounds, and at the time of the accident contained gravel which had not been weighed. While the load had been dumped at the scene of the accident and the weight could not be ascertained, this car together with three other cars of like capacity had been loaded with approximately the same amount of gravel, which in the case of the other cars was weighed subsequently and found to have an average net weight of 105,000 pounds.

The side-bearing clearance was checked by fitting the truck bolster to the body bolster at the B end of the car. At first the side bearings contacted, but the center plates showed that the side-bearing clearance had been adjusted by the use of large washers; washers then were taken from the center plate of the truck at the opposite end of the car and placed in this center plate, after which the side bearings had a clearance, overall, of $3/16$ inch; this, however, would not reflect what it would be after the car settled from movement when loaded, and it is probable that there was very little if any side-bearing clearance at the time of the accident. This car was in the shops at Coffeyville, Kans., on December 9, 1934, at which time it was jacked up on the B end and the R-2 column bolt renewed.

General Car Inspector Dysart stated that on the Missouri Pacific Railroad in 1934 there were 5,686 broken arch bars discovered, the cost for replacements being \$80,883.00, and information furnished by L. W. Baldwin, Trustee, showed that during the same year the number of arch-bar trucks repaired amounted to 6,467, of which about 30 percent were system cars; the cost of the repairs amounted to \$90,397.00. In addition, 127 arch-bar trucks were found defective on line of road between terminals, involving a total cost of \$3,366.69. Mr. Baldwin also stated that during the year there had been 59 accidents caused by arch-bar trucks, with a resulting expense of \$93,420.00.

Discussion

This investigation disclosed that the top and bottom arch bars on the right side of the rear truck of the eleventh car were broken. The top bar was broken at the front column-bolt hole and the bottom bar was broken at the bend about 3 inches

from the center of the rear hole of the front journal box. Each break was new, but the break in the bottom bar indicated that it had snapped, while the break in the top bar indicated that it had been torn apart as a result of the derailment. From the marks at the road crossing a short distance south of the spur-track switch, the bottom bar apparently failed at that point, and when the truck reached the switch the lower end of the front column bolt engaged the outside of the ball of the stock rail and struck the angle bar, but before the bolt broke off the pull was sufficient to jerk the lead wheels of that truck off the track. No apparent reason for the failure of the bottom arch bar at this particular point could be discovered.

The general situation with respect to arch-bar trucks is summarized as follows: In 1931 the American Railway Association adopted a rule to the effect that cars with arch-bar trucks would not be accepted in interchange from owners after January 1, 1936; this date recently has been extended to January 1, 1938; this extension gives the carriers something more than $2\frac{1}{2}$ years from the present time in which to replace arch-bar trucks. According to the figures of the Mechanical Division, Association of American Railroads, issued in March, 1935, of a total of 2,121,505 interchange freight cars owned or controlled by the railroads as of January 1, 1935, there were 672,597 equipped with arch-bar trucks, or 31.7 percent, and it was estimated that this number would be reduced by 51,111 cars by June 30, 1935, leaving about 29.3 percent of the present total still equipped with arch-bar trucks on that date. If a similar reduction in numbers should be made every 6 months, arch-bar trucks would not be eliminated from service until about June 30, 1941, while if no more progress is made in the future than was made during the 5-year period between January 1, 1930, and January 1, 1935, then arch-bar trucks will not be eliminated until about April 1, 1943. As regards individual railroads it is to be noted that one large railroad and several smaller railroads now own no cars equipped with arch-bar trucks, while there are many railroads, including the Missouri Pacific, making such progress as to justify the expectation that they will not own any cars equipped with arch-bar trucks after January 1, 1938. On the other hand, however, it is noted that the railroad owning the largest number of cars with arch-bar trucks, if it makes progress at the rate attained during the last 6 months of 1934 and estimated to be attained during the first 6 months of 1935, will not finally dispose of its arch-bar trucks until 1952, and there are other railroads which make an even worse showing for the same period of time, the figures for one of these railroads indicating that if its present rate is continued it will take

353 years to dispose of its arch-bar trucks. Many private car lines are not in as good condition as the railroads; in fact, one such concern owns more than 10,000 cars with arch-bar trucks and yet it reported a slight increase for the last 6 months of 1934 and does not contemplate any decrease whatever during the first 6 months of 1935. In addition, attention is directed to the fact that in some cases at least arch-bar trucks are more prevalent on locomotive tenders than on freight cars; for example, in connection with a recent accident investigation, figures were presented showing that 67.65 percent of all locomotive tenders on one railroad were equipped with arch-bar trucks, there being no particular difference in favor of passenger locomotive tenders as compared with those engaged in freight or switching service. In the case of the railroad on which the present accident occurred a somewhat similar condition prevails, the percentages of tenders equipped with arch-bar trucks in passenger, freight and switching service being 63, 65 and 73 percent, respectively.

Particular attention is directed to the information furnished by Mr. Baldwin showing that the number of arch-bar trucks repaired in 1934 amounted to 6,467 and that arch-bar trucks caused 59 accidents during the same period, the total expense incident to these two items amounting to \$183,817.00; also the statement of General Car Inspector Dysart that 5,686 broken arch bars were found on this railroad during 1934. These figures lend further emphasis to the necessity for all car owners to take active measures toward eliminating from service trucks of this type.

Conclusions

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

Recommendations

In view of the record of performance of arch-bar trucks shown in this report it is suggested that further consideration be given to the use of such trucks and that measures be taken by carriers and private car lines to eliminate arch-bar trucks from service at the earliest practicable date.

It is further suggested that consideration be given to the desirability of materially reducing the load limits of cars equipped with arch-bar trucks until such equipment can be eliminated from service.

Respectfully submitted,

W. J. PATTERSON,
Director.