

In re Investigation of an accident which occurred on the St. Louis, Iron Mountain & Southern Railway near Doylestown, Ark., on May 10, 1916.

On May 10, 1916, there was a derailment of a work train on the St. Louis, Iron Mountain & Southern Railway near Doylestown, Ark., which resulted in the death of one employee and the injury of two employees. After investigation of this accident the Chief of the Division of Safety submits the following report:

The branch on which this accident occurred is a single-track line, train movements being handled by time table and train orders. Approaching the point of accident from Doylestown, which is 2.3 miles north, the grade is about one percent descending for practically the entire distance. The track is straight. A short distance beyond the point of derailment is a 25-bent pile bridge; 15 bents on the southern end had been filled in recently, while the remaining 10 bents were in good condition and well maintained. The track is laid with 60-pound rails, 30 feet in length, laid in 1902 and 1903, with about 18 untreated oak ties under each rail, dirt ballasted. The alignment is good, but the track in general is slightly center-bound. The surface was in poor condition, but the depressions were uniform on both rails, measurements taken for a distance of one-quarter of a mile back from the point of derailment failing to reveal over one-quarter of an inch excess elevation on either rail.

The weather at the time of the accident was clear.

Work extra 2713, in charge of Conductor Griffin and Engineman Agnew, was engaged in loading ties at different points between Pine Bluff and Prague, Ark. The train left Doylestown, southbound, at about 11.30 a.m., with the locomotive backing up, hauling a train of 24 cars, and had reached the bottom of the grade, 2.3 miles from Doylestown, at about 11.55 a.m., when the leading wheel of the second pair of trucks of the tender was derailed, on the east side of the track. The balance of the truck was then derailed and the track was damaged by it for a distance of 180 feet. The bridge was then encountered and apparently at this point the safety chains on the derailed truck broke. The bridge saps and stringers were displaced, and the train finally came to a stop after the locomotive had passed over about 90 feet of the bridge.

The tender landed on the ground at the east side of the bridge, while the engine turned over to the west, badly damaging the bridge. The engine did not fall to the ground but remained suspended in the bridge wreckage, the employee killed being the head brakeman, who was crushed under the engine. The five cars immediately following the locomotive were derailed, three of them being thrown from the bridge.

Examination of the track showed that the first mark of derailment was an unbroken flange mark 8 feet in length, extending diagonally across the left rail to the point where it

dropped off and began to run on the ties, damaging the track and bridge and resulting in the derailment of the locomotive and cars.

Engineman Agnew stated that his train left Doylestown at about 11.30 a.m. It was necessary to use the air brakes all the way down the hill, in order to keep the speed of the train down to 8 or 10 miles an hour. He had made an application of 10 or 15 pounds and had just released the brakes when the tender truck jumped the rails, it appearing as if the truck had jumped from its center. He at once made an emergency application of the air brakes. The accident occurred at about 12.00 o'clock. He stated that in a derailment of this kind he would expect the leading truck to be the one derailed, and in this instance he thought the derailment might have been due to the center pin having worked loose between the truck and the bolster, stating that it seemed as if the tender jumped up and out to one side before he noticed that the truck had alued out to the side of the tender. From this he was of the opinion that the tender had jumped off the center before the truck was derailed. He did not see the center pin or make any examination of it, and did not know whether or not the back end of the engine rising out of the depressions in the track had had any influence in raising the tender off its center. He stated that this was the third day he had had this locomotive, and that he had experienced no

previous difficulty with it. He also said that he had not noticed anything wrong with the flanges, but that when he examined the wheels after the accident he found a piece of flange broken off one of the wheels of the tender truck, and he also found a car wheel which had a piece of flange broken off. Engineman Agnew also stated that the speed limit of a train when hauled by an engine backing up is 10 miles an hour, unless there is a pilot on the tender, in which case it is 20 miles an hour.

Fireman Blackburn stated that at the time of the derailment he had just gotten down on the deck of the locomotive for the purpose of putting in a fire. He was not in a position to say what derailed first, but the first thing he noticed was the tender jumping up and down. He thought the speed at this time was about 5 or 10 miles an hour. He did not know what caused the accident and did not know anything about the condition of the center pin in the tender truck.

Conductor Griffin stated that the engineman made one or two applications of the air brakes descending the hill, and that the speed was very low. At about this time the brakes were released, and after the train had traveled eight or ten car lengths they were again applied, and in a few seconds the emergency brakes were applied. He supposed that some one had flagged the train, but on looking out of the caboose saw the cars falling from the bridge. The speed at

the time the train was derailed was about 8 or 10 miles an hour. He said that the brakes were in good working order and the train was brought to a stop gradually without any unusual shock. Conductor Griffin also said that Engineman Agnew told him that the second pair of tender trucks was the first part of the train to be derailed. He stated that he examined the track and found where the wheel had mounted the rail, within about two feet of a joint. He did not form any opinion as to what caused the tender truck to mount the rail, whether it was due to a swing in the track or a low joint, but said that if it had been a low joint, in his opinion the truck would have mounted the rail right at the joint and not so far away from it as the point where the marks on the rail were found. The appearance of the wreckage indicated that this tender truck had damaged the track and the bridge, and that the leading pair of trucks had been on the rails. Conductor Griffin also stated that he found a broken flange on the derailed tender truck, about 10 inches of the flange having been broken. The break was fresh, and the fracture indicated that the metal had been crushed off. He looked for the pieces of the broken flange but could not find them. He also found a wheel from one of the cars, which had a broken flange. This piece of flange was about 3-1/2 inches in length, and apparently was broken off when the car was derailed, the pieces of the flange being found nearby. He examined the track for about one-quarter of a mile, but did not find the piece of broken flange from the tender wheel. Neither did he see any marks on the rails

which might have been made by a broken flange.

Rear Brakeman Judd stated that when the last application of the brakes was made, just prior to the accident, the gauge in the caboose showed an air pressure of 70 pounds. After the application was made the pressure was reduced to 50 or 55 pounds. It then started to go up and suddenly dropped back to zero. The speed at the time of the derailment was about 8 or 10 miles an hour. He stated that he did not form an opinion as to what caused the accident. He thought the second pair of tender trucks were first derailed. He saw the wheel with 8 or 9 inches of flange broken off recently, but did not know where the wheel came from, whether it caused the accident or was a result of it.

Locomotive 2713 is of the 4-6-0 type, the engine alone having a total weight of 115,000 pounds. The tender has a capacity of 3,600 gallons of water and 10 tons of coal, and at the time of the accident had nearly a full supply of water, while, according to the engineman's statement, about 2-1/2 tons of coal had been used. The male center casting is 11 inches in diameter, set 2 inches into the female casting, which is 12-1/2 inches in diameter. These castings, together with the pins, were found to be in good condition. The pair of tender wheels which are believed to have been the first to be derailed, and which had the broken flange, were cast iron wheels, 33 inches in diameter, of 80,000 pounds capacity, made in 1909. The 11-inch piece of broken flange was the only defect found.

The investigation of this accident clearly showed that the second pair of tender trucks was the first part of the train to be derailed, while it is also clear that the speed of the train was not excessive for a locomotive which was being operated backing up, and it is believed that the derailment of the truck was caused by the broken flange. While the flange mark on the ball of the rail was unbroken, yet it was only 96 inches in length. The circumference of the flange at its apex was 110 inches, and as the piece of flange broken off was 11 inches in length, it was possible for the intact portion of the flange to mark the rail for a distance of 96 inches without any mark being made by the broken part of the flange. Although careful search was made for some distance back from the point of derailment, the pieces of broken flange could not be located, and it is impossible definitely to say when and where the flange broke.