IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE CINCINNATI, NEW ORLEANS & TEXAS PACIFIC RAILWAY, SOUTHERN RAILWAY LINES WEST, NEAR NEW RIVER, TENN., ON APRIL 6, 1921.

April 18, 1921

On April 6, 1921, there was a derailment of a passenger train on the Cincinnati, New Orleans & Texas Pacific Railway, Southern Railway Lines West, near New River, Tenn., which resulted in the death of 5 passengers, and the injury of 74 passengers, 3 other persons and 1 employee. After investigation of this accident the Chief of the Bureau of Safety reports as follows:

Location.

This accident occurred on the Second District, which extends between Danville, Ky., and Oakdale, Tenn., a distance of 137.9 miles, in the vicinity of the point of accident this is a double track line over which trains are operated by time-table, train orders, and an automatic block-signal system. The accident occurred at a point 1,560 feet north of the station at New River. Approaching this point from the south there is a tangent 1,736 feet in length, near the northern end of which is a bridge over New River; there is then a curve of 6° to the left 1,302 feet in length, 665 feet of tangent, a curve of 4° to the right 477 feet in length, 234 feet of tangent, and a curve of 6° to the left 806 feet in length, the accident occurred on the last-mentioned curve at a point about 195 feet from its southern end. There is a descending grade of 1.14 per cent several thousand feet in length, ending about 200 feet south of New River station, this is followed by a vertical curve 490 feet in length, and an ascending grade

of 1.14 per cent extending some distance beyond the point of accident. The track is laid with 85-pound rails, 33 feet in length, with about 20 ties under each rail, it is tie-plated and rock ballasted, and on the curve on which the accident occurred is double-spiked on the gauge side of the inside rail The general maintenance of the track was good. Under time-table rule B1, the speed of passenger trains is restricted to 48 miles an hour; there is also a rule restricting the speed of passenger trains over New River Bridge to 30 miles an hour. The weather at the time of the accident was clear.

Description.

The train involved in this accident was northbound passenger train No. 2. It consisted of 1 combination baggage car and coach, 2 coaches, 8 Pullman sleeping cars, and 1 dining car, in the order named, hauled by locomotive 6492, and was in charge of Conductor Dineen and Engineman Miller According to the train sheet, train No. 2 left Oakdale, 35.7 miles south of New River, at 1.24 p.m., 9 minutes late, passed New River at 2.29 p.m., 4 minutes late, and was derailed at about 2.30 p m. while traveling at a speed estimated by the crew to have been about 35 or 40 miles an hour

The locomotive and tender were derailed to the left and came to rest with the head end of the locomotive 528 feet north of the point of derailment, practically upright, fouling the southbound track. The first six cars in the train were derailed to the right, none of them being entirely overturned

The right sides of the rear half of the second, all of the third and fourth, and the head end of the fifth car were badly damaged by contact with rocks projecting from the rock bluff on the outside of the curve, all of these damaged cars were of all-steel construction.

Summary of evidence.

Examination of the track showed that there were wheel marks on the inside of the east rail, these marks being present on the first six ties south of a rail joint, about 5 or 6 inches from the base of the rail The bolts were sheared from the inside of this joint, while the rail opposite the joint was overturned to the left and its leaving end twisted outward There were wheel marks on the web of this overturned rail, beginning about 6 feet from its receiving end, and continuing northward for a distance of about $1\frac{1}{2}$ rail-lengths, beyond this point the track was practically demolished for a distance of about 500 feet.

A section crew in charge of Section Foreman McDonald was working at the point of accident, and the statements of Engineman Miller and Fireman Duncan indicated that the engineman sounded a road crossing whistle signal to warn them of the approach of his train. They were not flagged, noticed nothing wrong with the track or any unusual rolling of the locomotive, and said the locomotive suddenly seemed to be entirely derailed. On examining the locomotive immediately after the occurrence of the accident, Engineman Miller found it to be practically undamaged, with no missing parts, and he

said there was nothing about it which in his opinion could have caused the accident, this was also the opinion of Fireman Duncan. On examining the track the engine crew saw that the angle-bar bolts had been sheared from a rail joint on the inside of the east rail, the engineman also said the east rail was low, while the fireman noticed wheel marks but did not know what wheels had made them

Approaching the point of accident Baggagemaster Puckett heard the engineman sound what he thought was a road crossing whistle signal. He said his first knowledge of anything wrong was when he felt that the locomotive was derailed, while the combination car lunged forward against the tender. Neither Baggagemaster Puckett, Conductor Dineen, Flagman Stines, nor Train Porter Harris, made any examination of the track or equipment, the conductor was told by members of the section crew that they had seen the track buckle under the locomotive.

Section Foreman McDonald said that about a week previously he had been notified by Track Supervisor Argo that the track on the curve on which the accident occurred was rough, and to repair it. On going to that point on the morning of the accident he found that the gauge was about $\frac{1}{4}$ inch wide, while the elevation was $3\frac{1}{2}$ inches, he expressed the opinion that this elevation was insufficient and that it should have been $4\frac{1}{2}$ or 5 inches. He did not, however, consider the track to be dangerous for trains moving at scheduled speed After the noon hour he received instructions from

Trainmaster Higgins about a place nearby which needed attention, and after attending to that he hurried back to the point where he had been working, as he was anxious about it. He said there were indications that the rails were expanding on account of the heat, and at times while putting in ties he would stop and ease the track up the hill a little in order to relieve the expansion, this work being done a little in advance of his work of putting in new ties. He said he pulled the track about 3 or 3½ inches in the vicinity of the run-off which tapered the elevation between the old and the new work, put in new ties, and tamped with shovels. He had put in 43 ties, and was increasing the elevation to 4½ inches, at the time of the accident all but three of the new ties had been spiked, these three unspiked ties being alternate ties. Section Foreman McDonald considered the run-off to be in good condition and safe for the passage of train No. 2, but when the train reached the point where he was working he saw the track slue under the locomotive, afterwards he found it had slued 11½ or 12 inches. Although he had heard the engineman sound a road crossing whistle signal, he had not heard the engineman sound a warning approaching the point of accident, and he said that if he had he would not have given a proceed signal in view of the speed at which the train was traveling, he estimated this speed to have been about 60 miles an hour This was the first day Section Foreman McDonald had worked in this vicinity since he had been assigned to this territory about 2 weeks previously, although

he had inspected this portion of the track on the previous day. He thought the accident was due to the expansion of the rails on account of the heat.

Roadmaster New, while passing over this portion of the road on a motor car on the day of the accident, met Section Foreman McDonald at about 10.30 a.m in the vicinity of the point of accident. He saw that he was putting in some ties, surfacing the track, and giving it a general overhauling, inquired if there were indications of the rails being too tight, and instructed the section foreman to swing the track out around the curve to relieve the tension. On examining the track after the accident the indications were that it had moved 8 inches. Roadmaster New said it appeared that in making the run-off prior to the passage of train No. 2, the section foreman had tamped under the ties on the inside of the curve, but not on the outside, and that the thrust of the locomotive to the right or outside of the curve, on reaching the track which was swinging, resulted in the locomotive rolling back toward the inside, turning over the inside rail and derailing the locomotive. The spikes on the inside of this rail were pulled and the rail twisted outward, while there were wheel marks on the inside web, these marks extending a distance of about 1½ rail-lengths, beyond which point the trac was demolished. He said the ties under the rail which turned over were in good condition, tie-plated, and double-spiked on the inside.

Track Supervisor Argo said that about 10 days previously

he had instructed Section Foreman McDonald to unload some ties for the purpose of retimbering the curve, and also told him to increase the elevation by 1 inch, he did not fix any definite time for the performance of this work, and said that while the curve needed more elevation he did not think the track unsafe for the maximum speed at which passenger trains are allowed to be operated. He was in company with Roadmaster New when the latter passed over this section of the road on the motor car on the morning of the accident, and did not observe anything in the work being done by the section foreman to cause criticism, neither did he notice any indications of over-heated rails On reaching the scene of the accident shortly after its occurrence Track Supervisor Argo saw the rail which had been overturned and twisted, and his statements as to the lack of proper tamping in the vicinity of the run-off and the manner in which the inside rail overturned practically agreed with those of Roadmaster New, he also said that under the conditions which existed a moving train striking the outside of the curve would practically cause the elimination of the elevation

Trainmaster Dearing, who reached the scene of the accident on one of the wreck trains, found one of the inside rails turned over, with the spikes about half pulled. The joints were not jammed together as tightly as he thought would have been the case with buckled track. Trainmaster Dearing said the ties had not been well tamped on the outside

of the curve, and he expressed the opinion that the accident was due to the run-off not being properly tamped, resulting in the rail going down under the weight of the train possibly lower than the inside rail

The statements of Trainmaster Higgins verified previous statements as to the turning over, twisting, and marking of the rail on the inside of the curve, and also the pulling of the spikes on the inside of this rail, and the shearing of angle-bar bolts from a joint on the inside of the east rail. He expressed no definite opinion as to the cause of the accident.

Locomotive 6492 is of the 4-8-2 type, with a total weight, locomotive and tender loaded, of 485,800 pounds It had recently received a general overhauling, leaving the shop on January 25, 1921. Master Mechanic Cassady said his examination of this locomotive after the accident failed to disclose anything which in his opinion could have caused it to be derailed.

Conclusions.

This accident was caused by the weakened condition of the track as a result of repairs which were being made by the section foreman.

The evidence indicates that Section Foreman McDonald was putting in new ties and was also increasing the elevation. In doing this work he had put in a run-off between the old and new elevations, and while the ties apparently were tamped on the inside of the curve, it appeared that they were not properly tamped under the ends of the ties on the outside