INTERSTATE COMMERCE COMMISSION

- - - - -

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE NEW YORK, ONTARIO & WESTERN RAILWAY NEAR ARROWHEAD, N.Y., ON DECEMBER 25, 1922.

January 22, 1923.

To the Commission:

On December 25, 1922, there was a derailment of a milk train on the New York, Ontario & Western Railway near Arrowhead, N. Y., resulting in the death of 1 employee, and the injury of 1 employee.

Location and method of operation.

This accident occurred on the Northern Division, extending between Sidney and Oswego, N.Y., a distance of 124.72 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 approximately 3,135 feet north of the station at Arrowhead. Approaching this point from the south there are 7,500 feet of tangent, followed by a 1-degree 15-minute curve to the left 1,060 feet in length, the accident occurring just north of the center of this curve. The grade is practically 1 per cent descending for northbound trains. The track is laid with 76-pound rails, yellow pine ties, and ballasted with cinders. The weather was clear at the time of the accident, which occurred at about 7.55 p. m.

Description.

Northbound milk train No. 9 consisted of 2 milk cars, and 1 combination passenger and baggage car, in the order named, all of wooden construction, hauled by engine 271, and was in charge of Conductor Swertfager and Engineman Young. This train left Fulton Broadway, 2.65 miles from Arrowhead, at 7.43 p.m., 28 minutes late, stopped at Fulton, and was derailed north of Arrowhead while traveling at a speed estimated to have been between 25 and 30 miles an hour.

The entire train was derailed to the right, the engine, tender, and first two cars coming to rest on their right sides, in line, and just east of the track, while the last car remained upright. The forward end of the engine came to rest about 340 feet north of the point of derailment. The employee killed was the engineman.

Summary of evidence.

While passing Arrowhead, Fireman Fritz was riding in the real cab, engine 371 being of the double-cab type, on the left seat of the tender, at which time speed was between 15 and 25 miles an hour, and immediately afterwards speed was increased. The first knowledge he had of anything wrong was when the engine was derailed to the left, at which time he heard Engineman Young shut off steam, following which the tender lurched to the left, then to the right, back again to the left, then was derailed. He estimated the speed at the time of the accident to have been between 25 and 30 miles an hour. The first intimation other members of the crew had of anything wrong was when the air brakes were applied.

Inspection of the track after the accident disclosed that the rails were spread alternately, at irregular intervals, such as would be caused by side thrusts from an engine, the spike holes being elongated. Starting at a point 45 feet south of the southern end of the curve, variations appeared in the gauge, extending outward from the original position of each rail, which were approximately as follows:

WEST RAIL

VARIATION	APPROXIMATE LENGTH	
0	62	feet
1/4 inch	25	"
0	50	"
1/2 "	75	"
0	210	"
1/4 "	43	"
0	140	"
1/4 "	70	"
0	30	"
1 "	60	" *
0	30	"
1/2 "	30	"

*Rail broke about 7½ feet from its receiving end, 711 feet from beginning of curve.

EAST RAIL

VARIATION	APPROXIMATE LENGTH	
1/4 inch	14	feet
0	4	"
1/4 "	25	"
0	32	"
1/4 "	28	"
0	2	"
1/4 "	30	"
0	60	"
1/4 "	60	"
0	30	"
1/4 "	35	"
0	30	"
1/4 "	65	"
0	65	"
1/4 "	30	"
0	45	"
1 "	58	"
0	35	"
1/4 "	57	"
0	30	"
1/4 "	63	" *
0	31	"
1/2 "	36	"

*Point opposite which west rail broke.

Starting at a point 315 feet north of where the variation in gauge first appeared in the east rail, there were crescent shaped marks in the snow, 2½ to 3 inches below the top of the rail, the marks appearing at intervals of 4½ feet, they were 6 to 8 inches in length, 1 inch in width, and from 4 to 5 inches from the gauge side of the rail, and extended to where the track was torn up, a distance of about 570 feet. At a point about 265 feet north of where the first crescent-shaped mark appeared in the snow, an abrasion appeared on the gauge side of the head of the west rail, extending over a distance of about 170 feet, and ending at an angle bar, while angle bar bolts were marked or sheared off on the gauge side of this rail within this distance. The first mark on a tie appeared close to the gauge side of the west rail, at a point 15 feet south of where the abrasion on the gauge side of the head of the rail ended, and 10 feet farther east north tie marks also appeared close to the gauge side of the/

rail. At this point the west rail had been moved outward 1 inch, and the east rail ½ inch, the west rail broke at a point 7½ feet north of where the abrasion on the gauge side of the head ended but remained in place. There was a light mark on the head of the west rail, 22½ feet in length, starting on the gauge side of the rail at the point of break and extending gradually outward. Beyond this point there were marks on both sides of the west rail, and on the gauge side of the east rail, for a distance of about 70 feet, from which point the track was completely torn up for about 240 feet.

The superelevation of the outside rail on the curve ranged from ¼ to 2¼ inches, being 1½ inches at the point opposite where the inside rail broke.

Maintenance of Way Engineer Heidenthal stated he was informed by Roadmaster O'Connor that the wreck train and also passenger trains proceeded over that portion of the track in which the variation in gauge existed, as far north as the broken rail, without being derailed. It also appeared that train No. 1, which was following train No. 9 closely, was able to pull up to within a few car lengths of the derailed equipment. Yardmaster Belisle was of the opinion the accident was caused by spread rails. Road Foreman of Engines O'Neil made an examination of Engine 271 after the accident, and stated the engine was in good condition and he saw nothing to indicate the derailment had been caused by anything dropping from the engine.

A detailed examination of engine 271, which is of the 2-6-0 type, weight on each pair of driving wheels 50,200 pounds, and on engine truck 22,400 pounds, was made at Norwich yard on January 4, 1923, by Mechanical Engineer Davis and Master Mechanic Delay. Everything about the engine truck was found to be in place and in good condition, the contour of the wheel flanges was normal, showing no tread wear. These wheels gauged 53 3/8 inches at two points, and 53 7/16 inches at another point, while the lateral motion was approximately 13/16 inch. The front driving wheels gauged 53 5/16 inches at three points, and had about ½ inch lateral motion, the wheel treads were 4 inches thick, and although the flanges were worn they were still within gauge limit. The outside edge of the wheel tread of the left front driving wheel was scored from contact with angle bars and bolts. The main driving wheels gauged 53 3/8 inches at three points, and had ¼ inch lateral motion, the wheel treads and flanges were in good condition. The outside face of the tread of the left wheel was scraped, indicating contact with the rail. The rear driving wheels gauged 53 1/4 inches at two points, while the wheel treads and flanges were in good

condition. As the hub liner was missing from the right rear driving wheel, the lateral motion could not be verified, however, it was 1¼ inches with this condition existing. The left forward tender truck wheel was scored on its outer edge. The drawbar at the forward end of the tender had a lateral clearance of 6 inches, and a vertical clearance of 3 inches, there being no indication of interference with the tender frame.

At the time of this investigation no information was available as to when or where the hub liner became lost from the rear right driving box, that it had not been gone long was evident from the fact that the metal of the box was clean. Careful examination by the Commission's inspectors failed to disclose any defects which could have caused the engine to be derailed.

Conclusions.

The cause of this accident was not definitely ascertained.

The marks on the outside face of the left forward driving wheel and the scoring and shearing of angle bars and bolts on the inside of the left rail would indicate that this wheel had been running on the inside of the rail. On the other hand, the rails apparently had not been spread enough to allow a wheel to drop between the rails, and it also appeared that the rails had spread at different points south of where the first abrasion appeared on the inside of the left rail, indicating that the condition which caused the rails to spread existed before the engine reached the point where the first marks on the rails were made, the marks in the snow on the inside of the right rail also began at a point south of the first marks on rails or ties. It is possible that the hub liner was lost out of the right back driving box just prior to the occurrence of the accident and that the increased lateral motion resulting thereby caused the engine to swing from one side to another to such an extent as to spread the rails slightly, and finally to result in the breaking of the rail on the inside of the curve, at which point a wheel, or wheels, mounted the inside rail and dropped off on the outside. This possible explanation, however, does not account for the marks in the snow, or for the fact that south of where the rail broke something had been scraping the inside of the left rail and cutting off angle-bar bolts.

All of the employees involved were experienced men. At the time of the accident none of them had been on duty in violation of any of the provisions of the hours of service law.

Respectfully submitted,

Director, Bureau of Safety.