

Inv-2297

INTERSTATE COMMERCE COMMISSION

Washington

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE
DENVER AND SALT LAKE RAILWAY

LOWELL, COLO.

SEPTEMBER 27, 1938

INVESTIGATION NO. 2297

SUMMARY

Inv-2297

Railroad: Denver and Salt Lake
Date: September 27, 1938.
Location: Lowell, Colo.
Kind of accident: Head-end collision
Trains involved: D. & R.G.W. passenger : D. & S.L. freight
Train numbers: 5 : First 72
Engine numbers: D. & R.G.W. 1201 : D. & S.L. 201
Consist: 7 cars : 41 cars, caboose
Speed: 20 m.p.h. : 8-15 m.p.h.
Operation: Timetable and train orders
Track: Junction of single and double track; 0.64 percent descending eastward.
Weather: Clear
Time: About 4:14 or 4:15 p.m.
Casualties: 1 killed, 26 injured.
Cause: Failure of inferior train to clear the schedule time of an opposing superior train as required by rule.

Inv-2297
November 18, 1938.

To the Commission:

On September 27, 1938, there was a head-end collision between a Denver & Rio Grande Western Railroad passenger train and a Denver and Salt Lake Railway freight train, on the tracks of the latter at Lowell, Colo., which resulted in the death of 1 trespasser and the injury of 16 passengers, 1 person carried under contract, 4 dining car employees, 1 employee off duty, and 4 employees on duty. The investigation of this accident was made in conjunction with a representative of the Public Utilities Commission of Colorado.

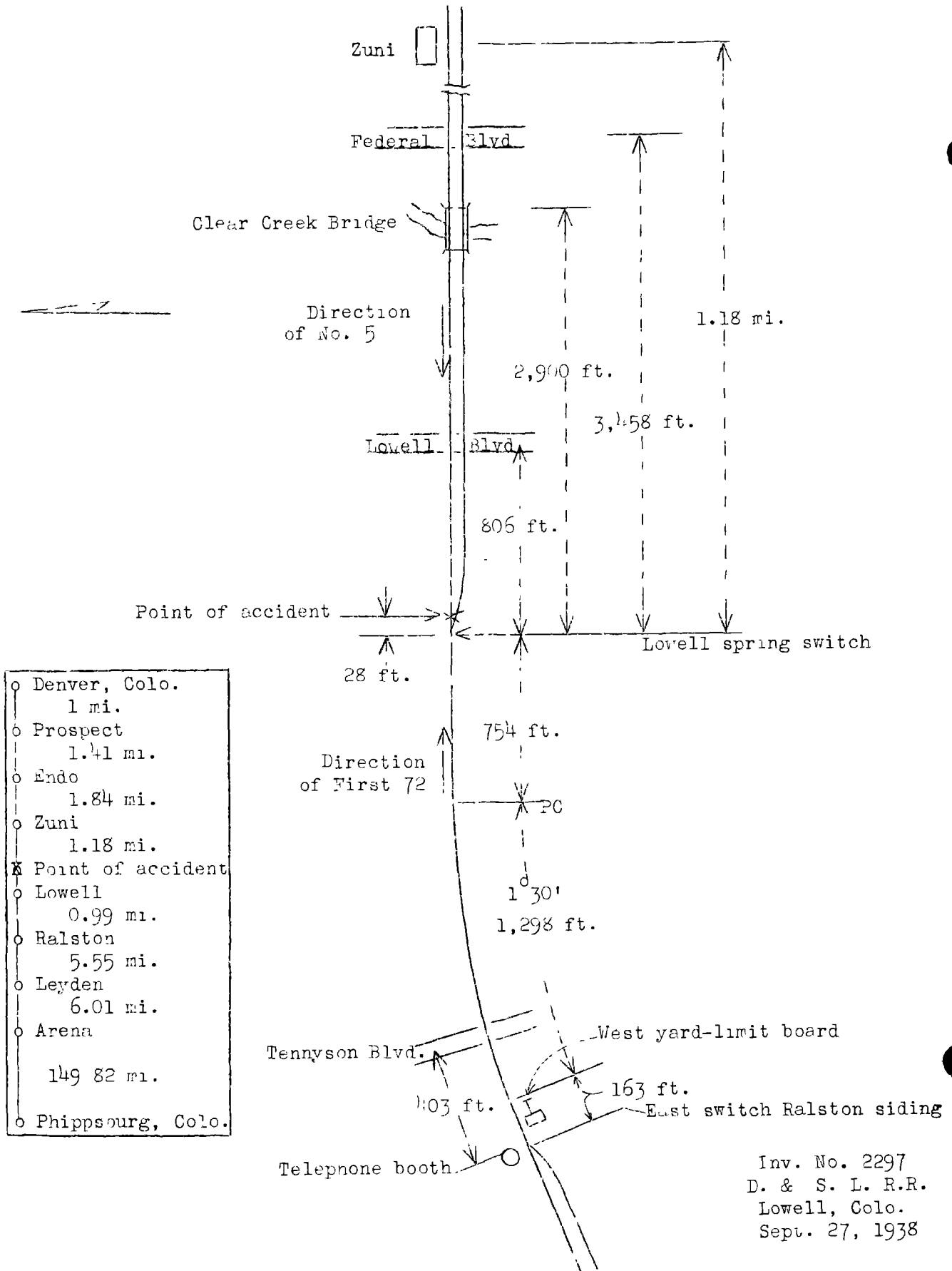
Location and method of operation

This accident occurred on Subdivision 1 which extends between Denver and Phippsburg, Colo., a distance of 167.8 miles, over which trains of the Denver & Rio Grande Western Railroad, hereinafter referred to as the D. & R.G.W., are operated. This is a single-track line except between Endo and Lowell, a distance of 3.02 miles, which is a double-track line. Endo and Lowell are located 2.41 and 5.43 miles, respectively, west of Denver. Train movements are governed by timetable and train orders, no block-signal system being in use. A spring switch is located at the junction of the single and the double track lines at Lowell, its normal position being for the eastward main track. The accident occurred within yard limits at a point about 28 feet east of this switch. Approaching from the east the track is tangent a distance of 6,180 feet to the switch and 754 feet beyond. Approaching from the west there are 2,809 feet of tangent track followed by a 1° 30' curve to the right 1,298 feet in length, and then the tangent on which the accident occurred. The grade for west-bound trains is 0.3 percent descending a distance of 1,900 feet, followed by a vertical curve 600 feet in length, and then 0.64 percent ascending a distance of 500 feet to the point of accident and approximately 1 mile beyond.

Due to trees being located on the inside of the curve, the view was somewhat restricted.

Rules of the operating department provide:

S-87. An inferior train must keep out of the way of opposing superior trains, and failing to clear the main track by the time required by rule must be protected as prescribed by rule 99.



S-89. At meeting points, between trains of different classes, the inferior train must take the siding and clear the superior train not less than five minutes, and must pull into the siding when practicable. If necessary to back in, the train must first be protected as prescribed by rule 99, unless otherwise provided.

93. ****Second and inferior class trains, extra trains, yard engines and light engines must move within yard limits prepared to stop unless the track is seen or known to be clear. ****

98. Trains must approach the end of two or more tracks, junctions, and railroad crossings at grade prepared to stop, unless the switches are properly lined, signals indicate proceed, and track is clear. ****

Special timetable rule 34 provides between Endo and Leyden, within which territory this accident occurred, a maximum speed of 60 miles per hour for passenger trains and 40 miles per hour for freight trains.

The weather was clear and the sun was shining at the time of the accident, which occurred about 4:14 or 4:15 p.m.

Description

No. 5, a west-bound D. & R.G.W. passenger train, consisted of one baggage car, one coach, one dinette-coach, one tourist sleeping-car, two standard sleeping-cars, and one dining-lounge car, in the order named, all of all-steel construction, hauled by D. & R.G.W. engine 1201, and was in charge of Conductor Mauzy and Engineman Willingham. This train passed Prospect, 4.43 miles east of Lowell, at 4:06 p.m., according to the train sheet, on time, passed Zuni, 1.18 miles east of Lowell, at 4:13 p.m., 1 minute late, and collided with First 72 at the junction of the single and the double tracks at Lowell while traveling at a speed estimated to have been about 20 miles per hour.

First 72, an east-bound D. & S.L. freight train, consisted of 41 cars and a caboose, hauled by D. & S.L. engine 201, and was in charge of Conductor Thomas and Engineman Ohrns. This train departed from Cliff, 31.61 miles west of Lowell, at 2:23 p.m., according to the train sheet, 4 hours 39 minutes late, passed Plain, the last open office, 19.02 miles west of Lowell, at 3:26 p.m., 3 hours 58 minutes late, and collided with No. 5 at Lowell while traveling at a speed variously estimated to have been from 8 to 15 miles per hour.

Engine 1201 telescoped engine 201 a distance of 7 feet. Engine 1201 was derailed and the engine truck and first pair of driving wheels of engine 201 were derailed; both engines were badly damaged. The first ten cars of First 72 stopped in various positions on each side of the track within a distance of about 100 feet; 8 of the cars were destroyed. The first car of No. 5 overrode the platform of the second car, telescoping the superstructure a distance of 15 feet, the rear truck of the first car being forced ahead. The remaining equipment in No. 5 was neither derailed nor damaged. The employees injured were the fireman of First 72 and the engineman, the fireman and the baggageman of No. 5.

Summary of evidence

Engineman Willingham, of No. 5, stated that the air brakes were tested at Denver and reported as functioning properly. He made the proper comparisons of his watch; it was 5 seconds fast with the standard clock at the station, 3 seconds fast with the conductor's watch and about the same as that of the fireman. His train left Union Station, Denver, at 4:02 p.m., 1 minute late, passed Prospect at 4:07 p.m., proceeded over 43rd and 48th Street crossings at a speed of 12 miles per hour, and over the various spring switches between Prospect and Utah Junction at a speed of 15 miles per hour, and did not attain a speed of more than 25 miles per hour until after passing the last spring switch at Utah Junction, approximately $1\frac{1}{2}$ miles east of Zuni. He then increased speed to about 40 miles per hour, but reduced to 25 miles per hour to pick up slow orders when passing Zuni. The train passed that point at 4:13 p.m. After Engineman Willingham read the orders, which restricted the speed at locations west of the point of accident, he handed them back to the fireman, at which time he thought they were about 25 or 30 car lengths west of Zuni. He then looked ahead and there was nothing to distract his attention. He looked at his watch as he passed over Federal Blvd., located 3,458 feet east of Lowell switch, and it was 4:15 p.m. He could see a distance of about 60 car lengths to the curve and the track was clear. Just after passing over Lowell Blvd., located 806 feet from the switch, he saw an approaching train as it was leaving the curve and entering the tangent track on which the accident occurred. The fireman apparently saw it at the same time as he called a warning. His train was then traveling at a speed of 40 or 50 miles per hour and he immediately closed the throttle, applied the air brakes in emergency and opened the sanders; he felt the brakes taking hold. Both he and the fireman jumped off; he said that he jumped off when about 1 car length from the switch, at which time the speed was about 20 miles per hour. He fell and after getting up he looked at his watch and it was 4:17 p.m. He thought that the freight train was moving at the time of the accident.

Fireman Harris, of No. 5, stated that it was 4:13 p.m. when he picked up the orders at Zuni and while the engineman read the orders he was looking ahead from the left side. Fireman Harris then reached for the orders and after reading them he hung them on the engineman's side of the cab, and he thought at that time the engineman was sounding the crossing whistle signal for Lowell Blvd. He returned to his side of the cab and looking ahead saw a train approaching around the curve; by the time he could warn the engineman the train was entering the tangent track. He jumped off when about 5 or 6 car lengths from the switch, at which time the speed of his train was between 20 and 25 miles per hour. After getting up he looked at his watch and it was 4:17 p.m.

The statements of Conductor Mauzy, of No. 5, corroborated those of the engineman and the fireman as to the time their train passed the various points en route. He was in the second car when he felt the air brakes being applied in emergency; he braced himself, took out his watch and it was 4:14:30 p.m. He was not sure as to the speed at the time of the emergency application but thought it was about 35 miles per hour and that the speed had been reduced to about 20 miles per hour at the time of the collision.

Head Brakeman Cox, of No. 5, stated that he was standing beside Conductor Mauzy when the latter took out his watch at the time the air brakes were applied in emergency and he saw that it was 4:14:30 p.m. The statements of Flagman Willis concerning the movement of No. 5 corroborated those of the conductor and the brakeman in all essential details.

Engineman Ohrns, of First 72, stated that an air-brake test had been made before leaving their initial terminal and the brakes functioned properly. He compared his watch with the standard clock at Phippsburg and also with the watch of the conductor, and there was very little variation; he later compared time with the fireman and the head brakeman. Engineman Ohrns stated that at Arena he had discussed with the head brakeman the subject of clearing No. 5 at Lowell and the latter indicated that they had sufficient time. They were at Arena about 6 minutes and left there about 3:44 p.m. His engine passed the east switch at Leyden, 6:54 miles west of Lowell, at 3:58 p.m., and after leaving that point he computed his running time and thought that he could clear No. 5 at Lowell. He arrived at the west switch of the siding at Ralston, 5.55 miles beyond, at 4:08 p.m., and when at a point about 8 or 9 car lengths east of the east switch he compared time with the fireman and it was 4:10 p.m., and the fireman remarked that they could

get their train in the clear before the schedule leaving time of No. 5, which is 4:14 p.m. His train was then traveling at a speed of about 25 miles per hour. In a later statement, however, Engineman Ohrns said that when 8 or 9 car lengths beyond the east switch it was 4:09 p.m., and in another statement he said it was about 4:07 at the west switch and 4:08 at the east switch and that he had 6 minutes to reach the double track at Lowell. The siding at Ralston is 1.12 miles in length. He also made a statement that his speed was 30 or 35 miles per hour when passing the east switch at Ralston. After passing that switch he saw the smoke of No. 5 in the vicinity of Zuni and he continued to watch the smoke of that train, and at no time was there any indication of the engine being shut off. He sounded his engine whistle almost continuously and began to reduce the speed of his train to enter the double track. He first made a 10-pound brake-pipe reduction, then about a 4 or 5-pound reduction, bringing the speed down to about 10 miles per hour; he then made an emergency application of the brakes and the train stopped prior to the collision. Engineman Ohrns admitted that he was a little short of clearing No. 5 the full five minutes, as required by rule, that he violated the yard-limit rule and that he could have stopped his train when he first saw the smoke of No. 5, but was depending on the schedule time of No. 5, stating that he thought No. 5 would stop and clear the double track on account of being ahead of schedule. As soon as the accident occurred he jumped off the engine and ran over to some sectionmen on the C. & S. track and checked his watch with the section foreman's and they were the same. He said the section foreman informed him that the accident occurred at 4:11:05 p.m. Head Brakeman Fisher was with him when the comparison was made. The engineman said that at the maximum authorized speed of 15 miles per hour entering the switch at Lowell it would have taken 1 minute 43 seconds from the time the engine entered the switch until the caboose was into clear.

Fireman Bishop, of First 72, stated that at Arena he asked the engineman where they would go for No. 5 and the engineman replied, "To the double-track." Approaching Ralston the engineman sounded the whistle and the fireman looked at his watch and it was about 4:06 p.m. He again looked at his watch when they were a few car lengths west of the east siding switch at Ralston and it was 4:09 p.m., and he asked the engineman if they had time to go to Lowell, adding that their time was a little short. The engineman replied that they could clear No. 5. He knew that No. 5 was due to leave Lowell at 4:14, and under the rules his train should have been in the clear at Lowell at 4:09 p.m.; he thought they would get into clear before 4:14 p.m.

They passed the east switch at Ralston at a speed of about 30 or 35 miles per hour. The engineman sounded the whistle almost continuously from Ralston to Lowell. Crossing over to the engineman's side Fireman Bishop saw the smoke of No. 5 and when he returned to his own side of the cab they were entering the tangent track and he could see the train approaching at a good rate of speed. He warned the engineman but the latter had already begun to reduce the speed. Fireman Bishop then descended to the step to jump off and as he did so the engineman closed the throttle and applied the air brakes in emergency. When he jumped off the speed was about 15 miles per hour; he fell down the embankment and, according to his position in relation to the wreckage after the accident, he had jumped off between 3 and 4 car lengths from the point of accident. He stated that he lost his watch in the accident.

Head Brakeman Fisher, of First 72, stated that he compared his watch with the standard clock at Phippsburg and also with the conductor's and the engineman's watches. At Arena, he asked the engineman where they were going for No. 5, and the engineman replied, "To the double track." The brakeman then asked him if the time was not going to be a little short, and the engineman said that he could clear them by 4 minutes. Brakeman Fisher rode in the brakeman's cabin on the tender. At Ralston he relayed a proceed signal from the rear end to the engineman; they passed the east switch at 4:08 p.m. Reaching a point about 10 or 12 car lengths east of the east switch at Ralston he started to go to the engine cab, but the fireman had closed the coal gate so he went on top of the cab. He heard a warning signal sounded by his engineman and looking ahead he saw No. 5 which appeared to be some distance east of Lowell Blvd.; his own train was then 25 or 30 car lengths from the Lowell switch and his engineman was reducing speed. Brakeman Fisher went back to the tender and seeing that an accident was inevitable he started down the ladder and the accident occurred immediately thereafter. His train was moving at a speed of 8 or 10 miles per hour. He was thrown off and immediately after getting up he looked at his watch and it was 4:11. A section motor-car on the C. & S. Ry., which parallels their tracks on the south, came up to the wreckage and he asked the foreman if he had witnessed the accident and what time it had occurred. The section foreman replied that it had occurred at 4:11. The engineman, the head brakeman and the section foreman checked their watches and all indicated 4:14 p.m. at that instant.

Conductor Thomas, of First 72, stated that he compared his watch with the standard clock at Phippsburg. He thought they stopped at Arena about 8 minutes and left that point at 3:43 p.m. Approaching Leyden he heard the station whistle signal, looked at his watch and it was 3:56 p.m., then he gave a proceed signal, and

planned to go to Zuni for No. 5. As the caboose passed over the west switch at Ralston he had his watch in his hand and it was 4:07 p.m. He realized that they were on short time, but with a running time of 2 minutes to Lowell he figured they had time to get into clear; he knew they should be into clear at 4:09 p.m. under the rules but was depending on rules 98 and 99 for protection. There was no doubt in his mind that they could clear No. 5 at Lowell. The speed of his train was about 35 miles per hour, and as the caboose reached the middle of the siding he noticed a reduction in speed. He got up into the cupola on the right side and could see smoke ahead. The train continued to reduce speed and the caboose stopped with a jar at 4:10:40 p.m. He looked at the air gauge and it went down to zero. He and the flagman started toward the head end of the train and seeing what had occurred he instructed the flagman to go back to the telephone to report the accident. They were then about 6 or 8 car lengths from the rear of their train and the telephone booth was located about 700 feet west of the caboose.

Flagman Everett, of First 72, stated that his train was traveling at a speed of between 12 and 15 miles per hour and then it stopped suddenly. After the accident he walked toward the head end of the train a distance of 8 or 10 car lengths, crossed over to the C. & S. right-of-way to see what had occurred; and then went back to the telephone booth located 724.7 feet west of the caboose. He thought that about 5 or 6 minutes elapsed from the time of impact to the time he reported the accident. He stated that he did not know it was necessary to clear No. 5 at Lowell by five minutes.

Operator Epstein, at Zuni, stated that he received from the dispatcher the clearance for No. 5 at 4:07 p.m. No 5 passed at a speed of about 40 miles per hour, the usual speed, and after he delivered the three sets of orders to the crew of that train he looked at his watch and it was 4:13 p.m. After the train passed he had a little difficulty in finding one of the hoops, and had to go about 250 yards for one of them. He watched No. 5 and saw First 72 in the vicinity of the curve and saw that there was trouble. Returning to the office and picking up the telephone he heard Brakeman Everett reporting the accident to the dispatcher, and as soon as he could talk to the dispatcher he reported No. 5 having passed Zuni at 4:13 p.m.

Dispatcher Stephenson stated that when Brakeman Everett called him by telephone to report the accident he looked at his watch and it was 4:16:50. He had checked his watch with the standard clock and his watch was 10 seconds fast.

Chief Dispatcher Culbertson stated that the record showed the accident was reported by Brakeman Everett at 4:17 p.m.

Section Foreman Gaston, of the C. & S. Ry., the tracks of which parallel the D. & S. L. track about 75 feet to the south, stated that he and his men had been working at a point about 1,300 feet west of the point of accident and were preparing to leave when his attention was attracted by the continuous short blasts of the whistle sounded by the freight train. The train was in the vicinity of Tennyson Blvd., which is located approximately 1,840 feet west of the point of accident; when he first saw the train it was moving at a speed of about 20 miles per hour. He then looked eastward and saw the passenger train which appeared to be east of Lowell Blvd., but he was unable to estimate its speed. It was working steam until it reached Lowell Blvd.; both trains were moving at the time of collision. Section Foreman Gaston stated that he and his men realized an accident was imminent and they ran toward the south side of their right-of-way, but as soon as the accident occurred they boarded their motor-car, the motor of which they had left running, and proceeded down to the scene of accident. Two members of the freight crew came over to the motor-car and asked him to compare time, and his watch, which was a standard watch, at that time showed 4:14 p.m. The watch of one of the men showed the same time, but he did not see the other man's watch. He did not look at his watch when the accident occurred but thought that it occurred about 4:10 or 4:11 p.m. The statements of the section laborers practically corroborated those of Section Foreman Gaston.

Conductor Tindall, of Extra 3402 West, stated that his train had a meet order with First 72 at Arena, at which point his train entered the east switch of the siding. First 72 cleared the west switch at 3:45 p.m., immediately after which Extra 3402 departed. Looking back when passing the west switch at Clay, located approximately 3 miles west of Arena, he saw First 72 when it started to leave Arena, at which time it was about 3:55 p.m.

Conductor Maas, of the C. & S. Ry., stated that his road practically parallels the D. & S. L. in the vicinity of Zuni. He was in charge of an east-bound freight train on the day of the accident and saw No. 5 approaching in the opposite direction at a point a short distance east of Zuni, at which time it was about 4:12 p.m.

George Scherzer, an eyewitness to the occurrence of the accident, stated that he was working in a field north of the D. & S. L. tracks, about 175 yards from the point of accident. Both trains were moving at the time of the collision. He saw the

flagman of First 72 start westward immediately after the accident. The farmer immediately went over to the scene and as he approached the wreckage on the south side he looked at his watch, about one minute after the accident occurred, and as nearly as he could remember it was about 4:16 p.m. He did not know whether his watch was correct.

General Superintendent Johnson stated that there was no speed restrictions for No. 5 over the spring switch at Lowell.

During the 30-day period preceding the day of the accident, a daily average of 21.8 train movements was made over the territory involved, according to a statement submitted by operating officials.

Observations of the Commission's Inspectors.

Tests were conducted to determine the distance an east-bound engine could be seen from the cab of a west-bound engine approaching Lowell; the same type of engines as those involved in the accident were used. The east switch at Ralston can be clearly seen from either side of a west-bound engine passing over Clear Creek Bridge, located 2,900 feet east of Lowell switch; this distance is about 5,144 feet and includes 3,683 feet of tangent, followed by 10° 30' curve to the left 1,298 feet in length, then 163 feet of tangent track; the view is practically unobstructed from the left side of an engine proceeding westward, but the view is gradually cut off from the right side by the boiler of the engine as it approaches the curve.

A train consisting of an engine and several cars, with the engine standing on Tennyson Blvd., approximately 400 feet east of Ralston switch, could be clearly seen its entire length from either side of an engine headed west and passing over Clear Creek Bridge. The train was in sight continuously from the left side of the engine as it proceeded westward; the view from the right side was gradually cut off and the train passed entirely from view at a point about 500 feet east of Lowell Blvd.

Discussion

There was considerable discrepancy in the evidence with respect to the time the accident occurred, the crew of First 72 stating that it occurred about 4:11 and the crew of No. 5 stating it occurred between 4:14 and 4:15 p.m. The scheduled leaving time of No. 5 at Lowell was 4:14 p.m., and under the rule First 72 was required to clear that train not less than five minutes, or at 4:09 p.m.

The engineman of First 72 stated in effect that his train arrived at Arena, 12.55 miles west of Lowell, about 3:38 and departed about 3:44 p.m.; the conductor stated in effect that the train arrived at Arena about 3:35 and departed about 3:43 p.m. The conductor of Extra 3402 West said that First 72 on arrival at Arena cleared the west switch at 3:45 p.m., and he looked back from a point approximately 3 miles west of Arena and saw First 72 just leaving Arena, at which time it was about 3:55 p.m. If First 72 left Arena at 3:55 p.m., then it would have 14 minutes in which to travel 12.55 miles to Lowell and clear No. 5, necessitating an average speed of 53.7 miles per hour, whereas the maximum authorized speed was only 40 miles per hour.

According to the statements of the engineman of First 72, he passed the east switch at Leyden, 6.54 miles west of Lowell, at 3:58 p.m., and after leaving that point he computed his running time and decided he could clear No. 5 at Lowell. The schedule running time of First 72 is 14 minutes from Leyden to Lowell, and based on that time he would reach Lowell at 4:12 p.m., leaving only two minutes to get into clear before the schedule arriving time of No. 5. He said it would have taken him 1 minute 43 seconds from the time his engine arrived at Lowell switch to the time the rear end would have been in clear. The engineman made three different statements as to the time he passed the east switch at Ralston; he first stated that he checked the time with the fireman when about 9 or 10 car lengths beyond the switch and it was 4:10 p.m.; in a second statement he said it was 4:09 p.m., and in a third statement he said it was 4:08 p.m. when passing the east switch. He also stated that immediately after the accident he checked his watch with the section foreman of the C. & S. Ry., and they were the same; the foreman advised him that the accident occurred about 4:11 p.m. The section foreman stated that it was 4:14 p.m. when the check was made but that he did not look at his watch until the check was made; he said he had just estimated the time of the occurrence of the accident; however, there was no evidence that 3 minutes elapsed between the time of the accident and the time of comparison and according to the movements made by the section men it appears probable that less than one minute elapsed. The flagman of First 72 said that 5 or 6 minutes elapsed between the time of the accident and the time he reported it to the dispatcher, which was at 4:17 p.m.; he explained that he first walked some distance forward before starting to the telephone at the rear, but a farmer nearby saw him go directly to the rear immediately after the accident occurred. The farmer fixed the time of the accident at 4:15 p.m. and since the flagman had but 725 feet to cover to reach the telephone it appears that the farmer's estimate was fairly accurate. The engineman of First 72 further stated

that shortly after passing the east switch at Ralston he saw the smoke of No. 5 at Zuni and at no time did he see any indication of the engine being shut off, yet he continued to operate his train to the end of double track in the face of the opposing first-class train. He sounded the engine whistle in an attempt to warn the opposing train and reduced the speed of his train to enter the double track, but said that he had stopped his train prior to the collision. The statements of the other members of the crew, as well as the other eye-witnesses of the accident, and the position of the wreckage, indicate that First 72 was moving at the time of the collision and that it had entered the switch a distance of about 28 feet when the collision occurred. The fireman, the head brakeman and the conductor all stated that their time was a little short to clear No. 5 at Lowell, the fireman said he called the engineman's attention to this fact but the latter denied it; all said they believed that they could reach Lowell before the leaving time of No. 5 even though they would pass through yard limits approaching Lowell.

The train sheet shows that No. 5 left Prospect 4.43 miles east of Lowell, at 4:06 p.m., on time, and passed Zuni, 1.18 miles east of Lowell, at 4:13 p.m., 1 minute late. There are two street crossings and several spring switches over which the speed is limited to 12 and 15 miles per hour, respectively, and according to the statements of the engineman of No. 5 he complied with these restrictions, and did not attain a speed of more than 25 miles per hour until after passing the last spring switch at Utah Junction, approximately 1 1/2 miles east of Zuni. He then attained a speed of 40 miles per hour which he reduced to 25 miles per hour at Zuni to pick up orders. That No. 5 could not have passed the point at Lowell for which time is shown in advance of 4:14 p.m. is conclusively established by the following: The times appearing on the train sheet, the fact that No. 5 had traversed a distance of 5.43 miles from Denver, its initial terminal, with the various speed restrictions being observed, the statement of the C. & S. Ry. conductor to the effect that he saw No. 5 a short distance east of Zuni at 4:12 p.m., the definite statement of the operator at Zuni that No. 5 passed that station at 4:13 p.m., one minute late, and that the distance from Zuni to Lowell is only 1.18 miles which would preclude the possibility of making up more than a fraction of a minute between these stations.

Approaching the point of accident from the east the track is tangent for more than a mile and the view of the track to the end of double track, and for several hundred feet beyond, was unobstructed. As No. 5 approached the end of double track both the engineman and the fireman observed that the track was clear until within about 800 feet of the switch, when First 72

was seen coming around the curve. The engineman of No. 5 applied the brakes in emergency but the distance was not sufficient to stop the train short of the switch. There was some evidence to the effect that the engineman and the fireman of No. 5 could have seen First 72 somewhat earlier by looking across the curve.

The average daily train movement of 21.8 trains over the territory involved during the 30-day period preceding the day of the accident, and the conditions disclosed by this investigation warrant consideration of the need of additional protection; an adequate block system probably would have prevented this accident.

Conclusion

This accident was caused by the failure of an inferior train to clear the schedule time of an opposing superior train as required by rule.

Recommendation

It is recommended that responsible officials of the Denver and Salt Lake Railway give consideration to the need of additional protection for train movements.

Respectfully submitted,

W. J. PATTERSON,

Director.