

In Re. Investigation of an Accident which  
 occurred on the Colorado & Southern  
 Railway at Boulder, Colo., on  
 November 17, 1916.

December 22, 1916.

On November 17, 1916, there was a side collision between a freight train on the Colorado & Southern Railway and a street car on the Western Light & Power Street Railway, at Boulder, Colo., which resulted in the death of 2 passengers on the street car and the injury of 2 passengers on the street car and the motorman of same. After investigation of this accident, held jointly with the Public Utilities Commission of the State of Colorado, the Chief of the Division of Safety reports as follows:

The Fort Collins District of the Northern Division of the Colorado & Southern Railway, on which this accident occurred, is a single track line, over which train movements are governed by time table and train orders. This portion of the railway is operated jointly with the Denver & Inter-urban Electric Railway.

The collision occurred at what is known as the 12th and Marine Street crossing, where the Colorado & Southern Railway crosses the Western Light & Power Street Railway at grade. The crossing is not at right angles, but approaching from the east the track crosses at an angle of 45 degrees and 10 minutes. Beginning at a point 1,175 feet east of the crossing, the track of the Colorado & Southern Railway passes through a cut 19 feet deep and 600 feet in length, on a 4-degree curve to the left. It is then tangent to a point 116 feet east of the crossing, where it enters a 6-degree curve which extends to and beyond the crossing. The grade of the Colorado & Southern Railway track at the crossing is about  $1\frac{1}{2}$  per cent ascending for westbound trains. The street railway track approaching this intersection from the north is straight for some distance, while the grade is approximately 7 per cent ascending for southbound cars.

On the day of the accident Colorado & Southern Railway switch train extra 429, in charge of Conductor Gleason and Engineman Slocum, was working between Mars Hill and Boulder, doing mine switching and station work. It consisted of 21 cars of coal and a caboose, hauled by locomotive 429, being operated backing up. This train passed Marshall at 8.41 p. m., and at about 9.00 p. m. collided with Western Light & Power Street Railway Company's car No. 3, while traveling at a speed estimated to have been about 4 miles an hour.

Western Light & Power Street Railway Company's street car No. 3 was 34 feet 6 inches long and had an underframe of steel construction, while the superstructure was of hardwood. The car was of the two-motor type, and was equipped with both Westinghouse air brakes and hand brakes, and also a Golden Glow 38-watt headlight. This car had a combined entrance and exit, located on the right side of the front vestibule, with folding doors and steps operated by the motorman. Car No. 3, in charge of one man only, - Motorman McKinley - was running from the junction of 12th and Walnut Streets to University Hill. Before reaching the crossing at 12th and Marine Streets cars running southward on this line have to cross the tracks of the Colorado & Southern Railway and the Denver, Boulder & Western Railroad, located at 12th and Water Streets. Stationed at the Water Street crossing, the street railway company has a flagman, who, after flagging a car across that street, boards the car and rides to Marine Street, a distance of 450 feet, for the purpose of flagging the car across the railroad track at that point. Car No. 3 left 12th and Walnut Streets at about 6.50 p. m., and Flagman Luton, after flagging across the Water Street crossing, boarded the car and rode inside the car to the Marine Street crossing. The motorman failed to bring his car to a stop before going over this crossing, and as the car reached the railroad tracks it was struck by extra 429.

In addition to the flagman, the crossing at 12th and Marine Streets is protected by a standard railroad crossing sign located at the north-east corner, and a Wig-Wag signal located on the northwest corner, 22 feet west of the street car track and 10 feet north of the railroad track. Suspended over the crossing, and attached to the main wire, is a small "STOP" sign, governing street cars approaching from either direction. The crossing at night is lighted by a 60-watt nitrogen lamp suspended over the middle of the street just south of the intersection of the tracks.

The street car was struck about 6 feet back from the front end sill by the right hand corner of the engine tank. The front end of the street car was pushed ahead of the tank 60 feet, and swinging around, knocked down the Wig-Wag signal mast, and turned over on its right side. The superstructure of the street car was completely destroyed. Locomotive 429 came to a stop about 130 feet west of the point of collision, having traveled about 180 feet after the emergency application of the brakes had been made. The damage done to the locomotive was slight.

Engineman Slocum, of extra 429, stated that on account of the height of the tank on the forward end of the locomotive, he was unable to see any distance ahead, and did not see the street car at any time until after the collision occurred. He stated that he sounded the whistle for the crossing when about 150 or 200 feet from it, and that, in compliance with a bulletin issued by the superintendent, he reduced speed to 4 miles an hour, using 8 or 9 pounds of air. When his locomotive was about at the 12th Street sidewalk he released the brakes, and at about that time the fireman saw that the street car was not going to stop before starting over the crossing and cried out to him to stop. Engineman Slocum stated that he then immediately applied the brakes in emergency, and that while this application worked properly, he was unable to stop in time to prevent the collision. Engineman Slocum further stated that the oil headlight on the rear of the tank was burning brightly at the time of the accident and was still burning after the accident occurred. He also stated that he has observed from time to time that the street cars occasionally cross the 12th and Marine Street crossing without coming to a full stop, as required by rule, and has noticed that the Wig-Wag signal protecting the crossing has failed to work.

Fireman Chapman, of extra 429, stated that when his train was about 300 feet from the crossing his engineman sounded the whistle, and when about 150 feet from the crossing he saw a street car approaching the crossing from the north at a speed of about 8 miles an hour. As the street car came close to the crossing it slowed down to almost a stop and the flagman stepped off the car and ran ahead to flag it over the crossing. Fireman Chapman stated that when the flagman was only a few steps ahead of the car, its speed began to increase, and he realized then that the street car was going to try to cross the railroad track ahead of the train. He at once shouted to the engineman to apply the brakes in emergency, which was done when the locomotive was at about the east sidewalk of 12th street. The fireman further stated that he thought the street car was moving ahead at the time of the accident. He also stated that the bell on the locomotive was ringing at the time and that the oil headlight was burning, and in good order. He said that he saw no light in the Wig-Wag signal on the evening of the accident and did not hear the bell in it ringing.

Motorman McKinley, of car No. 3, stated that as he approached the Marine Street crossing he looked for the Wig-Wag signal, and it was dark and motionless. He fed the controller up to 4 points, and when about 25 feet from the crossing he opened the door for the flagman to get out and threw the power off, coasting for about 10 feet. He stated that Flagman Lupton then stepped off of the car and gave him a proceed signal, and at the same time he looked up the rail-

road track, and not seeing any light or hearing any whistle or bell started his car forward. When about 3 feet over the railroad track Flagman Lupton shouted: "My God, look at that light!" He then threw the controller in the reverse position and was moving backward when the collision occurred.

Flagman Lupton stated that he boarded car No. 3 at Water Street and rode inside until within a short distance of the Marine Street crossing, and then got out on the steps. When within 3 or 4 feet off the crossing he saw the locomotive of extra 429 coming toward the crossing, the locomotive at that time being almost to the 12th Street sidewalk. He stated that he then shouted to the motorman, asking him if he did not see the locomotive and was he not going to stop. By that time they were on the railroad track, and he jumped across the track to the south side just as the collision occurred. Flagman Lupton further stated that he saw no light on the head end of extra 429, and heard no bell or whistle sounded by the crew of that train. He was sure that the Wig-Wag signal was not working and that it neither showed a red light nor a light of any other kind.

Signal Maintainer Selby stated that he examined the Wig-Wag signal at the 12th and Marine Street crossing at 1.30 p. . on the day of the accident, at which time everything was in good working order. He reached the point of accident at about 9.30 . . . a. m., and although the Wig-Wag was then out of order on account of the pole being knocked over by the street car, he noted no defect in the mechanism.

Practically all of the statements furnished by other witnesses to this accident point to the fact that the street car did not come to a full stop before attempting to cross the railroad track. The statements as to whether or not the enginemen of extra 429 sounded the whistle approaching this crossing are conflicting, but the preponderance of evidence indicates that he did so when the train was from 150 to 300 feet from the crossing.

This accident was caused by the failure of Motorman McKinley to bring his car to a stop before attempting to cross the railroad track of the Colorado & Southern Railway, in accordance with Rule No. 1 of the Western Light & Power Street Railway Company, which reads as follows:

"Make a complete stop before crossing any railroad and do not proceed until the conductor has given the signal."

Motorman McKinley admitted that he did not come to a stop before starting to cross the railroad track, and even though his statement that Flagman Lupton gave him a proceed signal may be correct, he must have known that he was not being properly signaled when he attempted to go over this crossing before Flagman Lupton had reached the railroad track.

The fact that the Wig-Wag signal, upon which the street car employees seem to depend, apparently was not working immediately prior to the accident, may have contributed to the accident. On account of it being torn down in the accident, the reason why the Wig-Wag signal was not working could not be definitely ascertained.

It will be noted that at this crossing the grade of the Colorado & Southern Railway is  $1\frac{1}{2}$  per cent., and that the grade of the Western Light & Power Street Railway Company is 7 per cent. For grades such as these the means employed to prevent collisions at this crossing seem to be inadequate, and a proper regard for safety would seem to require the use of derails, which would necessitate cars on the street railway coming to a full stop and sending a man ahead to the crossing to line up the rails before it would be possible for the street cars to pass.