August 10, 1915.
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IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE MINNEAPOLIS & ST. LOUIS RAILROAD NEAR HAYDENVILLE, MINN., ON JULY 7, 1915.

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On July 7, 1915, there was a derailment of a passenger train on the Minneapolis & St. Louis Railroad near Haydenville, Minn., which resulted in the injury of 8 passengers and 6 employees. After investigation of this accident the Chief of the Division of Safety reports as follows:

The train involved in this accident was eastbound passenger train No. 16, known as the "Aberdeen Limited," en route from Aberdeen, S. D., to St. Paul, Minn. It consisted of 1 mail car, 1 baggage car, 1 coach, 1 chair car, 1 coach and a Pullman sleeping car, in the order named, hauled by locomotive 206, and was in charge of Conductor Christensen and Engineman Nelson. It left Watertown, S. D., the last open telegraph office and a station 47 miles from Haydenville, at 11.08 p.m., 8 minutes late, and at 12.38 am was derailed at a point about one-half mile west of Haydenville while running at a speed estimated to have been between 35 and 40 miles per hour.

The entire train was derailed, the engine, tender and first two cars partially turning over to the left, while the next car tipped over to the right going over the side of the low bridge located at this point. The next two cars were partially tipped over to the right, while the sleeping car had only the forward trucks derailed and remained upright on the roadway. With the exception of the vestibules, none of the cars was materially damaged.

This part of the Minneapolis & St. Louis Railroad is a single-track line. No block signals are in use, trains being operated by train orders and time-card rights. The track is laid with 60-pound rails, 30 feet in length, laid in the track in 1884. There is an average of 16 ties under each rail, single spiked on both sides. Tie plates are used only on curves. The ballast is a mixture of sand and gravel, principally sand. Approaching the point of derailment from the west, there is a curve of 2 degrees, 30 minutes to the right, about 1,300 feet in length, then there is a tangent about 1½ miles in length, the first part of which is on a fill varying from 2 to 3 feet in depth, bridge No. 99, from which one of the cars fell, being located in about the middle of this curve. The weather was clear.

Examination of the track showed the first mark of derailment to be located about 101 feet west of the western end of the bridge. This was a flange mark on the ball of the rail on the north side of the track and ran diagonally from a point 11 feet, 6 inches from the eastern end of the rail to a point about 8 inches from the eastern end, where the wheel dropped off on the ties. The first mark on the opposite side of the track was a flange mark on the tie immediately east of where the wheel dropped off of the opposite rail, or the first tie west of the rail joint. The flange marks indicated that the derailed wheels then took a diagonal course toward the northern end of the ties. Beyond the fifth tie east of where the wheels dropped off the rails, the track was badly torn up and

the course of derailment could not be traced farther.

Engineman Nelson stated that his first intimation of anything wrong was when he felt a sudden backward pull as if the train had broken in two. He shut off steam and on looking back saw a streak of fire under the train, but before he had a chance to apply the air brakes, the train was brought to a stop. He did not think that the tender was the first part of the train to be derailed and stated that the fireman was working on the fire at the time and did not notice any derailment of the tender. Engineman Nelson further stated that the speed of trains at this point is limited by bulletin notice to 40 miles per hour and he estimated the speed of the train to have been about 35 or 38 miles per hour. Other employees riding on the train also estimated the speed to have been about 35 to 38 miles per hour.

Locomotive 208 was of the 4-6-0 type, weighing 121,000 pounds. It had a capacity of 9 tons of coal and 5,200 gallons of water. The cistern had been filled with water at Revillo, about 13 miles west of the point of derailment. A careful examination of the tender was made, but nothing was found which might have caused the accident. The two pairs of wheels on the forward truck had to be removed on account of the axles being slightly bent, but the bending of these axles was a result of damage sustained in the derailment. The entire train had received a running inspection at Watertown, at which time nothing wrong was discovered. Careful examination was also made of the damaged equipment but nothing was

discovered which might have caused the accident.

Measurements were made of the track surface for a distance of 255 feet west of the point of derailment. At the point of derailment the north rail was three-eighths of an inch low, 15 feet west of the point of derailment the rails were level, while at 30 feet the south rail was one-half inch low. Forty-five feet away the rails were even, while 60 feet away the north rail was one-fourth inch low and at 75 feet was three-eighths of an inch low. At 90 feet and 105 feet the south rail was three-eighths of an inch low, and one-eighth of an inch low at 120 feet. At 135 feet the north rail was three-fourths of an inch low and three-eighths of an inch low at 150 feet and 165 feet. The rails were even at 180 feet and the north rail one-half inch low at 195 feet. The rails were again even at 210 feet and the north rail one-fourth inch low at 225 and 240 feet, while at 255 feet the rails were even. The ties were found to be badly worn and cut by the bases of the rails, about 50 percent of the ties being base cut from 1 inch to 4½ inches, while occasionally a tie was found which had been cut nearly in two by the bases of the rails. The rails were found to have crept toward the east to such an extent that very few joints had more than 1 tie supporting them, while the general condition of the track was rough and uneven; the gauge, however, was good.

The section foreman stated that he had been over the

track on July 1. He usually went over it 3 times a week and at times he would go over it every day. He had 5-3/4 miles of track in his section and 2 section men to assist him.

It was impossible definitely to determine what part of the train was first derailed on account of the complete destruction of the track, badly bent and twisted rails and the damage sustained by the running gear of the cars. It is believed, however, that this derailment was due to the existence of track conditions which were such as not to permit of the safe operation of trains at the speed at which this train was running. The surface of the track immediately preceding the point of accident was shown to have been uneven and it is believed that this uneven condition resulted in the train rocking to such an extent that some of the wheels mounted the rail and dropped on the ties, causing the destruction of the track and the subsequent derailment of the entire train.

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