

INV. 316

JANUARY 25, 1918.

IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON
THE DELAWARE, LACKAWANNA & WESTERN RAILROAD
NEAR SLATERFORD JCT., PA., ON DECEMBER 23, 1913.

On December 23, 1913, there was a rear end collision between two westbound passenger trains on the Delaware, Lackawanna & Western Railroad, near Slaterford Jct., Pa., which resulted in the death of one passenger and one employee, and the injury of seven passengers and two employees. After investigation the Chief of the Division of Safety submits the following report.

The accident occurred on the Jersey cut-off of the Morris and Essex Division at a point about one-half mile east of the Delaware River. At this point the line is double track, the movement of trains being governed by time-table, train orders and an automatic block signal system.

The signals in use on this section of track are automatic, electric motor signals of the two-arm, two-position, lower quadrant type, normally displaying clear. Overlaps are not used. A home and a distant signal are located on each pole, the lower arm being a distant signal indicating the position of the home signal next in advance. At night the indications displayed are red for stop, yellow for caution, and green for proceed, the light being furnished by long-time oil burning lamps.

Beginning at a point about 1.8 miles east of the point of the accident and proceeding westward, the track is tangent for 7,73 feet. This tangent is followed by a curve of 1° 30 minutes to the right, 3058 feet in length. The point of the accident is 1,038 feet west of the point of this curve, and is located on a

fill 10 or 12 feet in height. At this point there is a grade of .5 per cent descending westward.

Signal No. 711, which is on a pole at the right of the track, is located 562 feet from the east end of the tangent described above. The next signal, No. 719, is on a signal bridge, over the track governed and is also located on the tangent, 4,525 feet west of signal 711. Signal No. 727 is on a signal pole at the right side of the track located about in the center of the curve and 3,730 feet west of signal 719. At this point there is a rock cut about 1,800 feet long and 50 feet in depth; signal 737 is located in this cut about 300 feet from its western end.

On the day of the accident, on account of holiday travel, train No. 9, en route from Hoboken, N. J., to Buffalo, N. Y., was running in three sections. The second and third sections of that train were involved in this accident.

Second No. 9 consisted of engine 1132, buffet car, and Pullman sleeping cars Tucson, Pacific, Corsico, Jovian, Latrobe, Cuba, Delawanna and Rembrandt, all of wooden construction except the club car, which had a steel under frame, and sleeping car Delawanna, which was of all-steel construction. The train was in charge of Conductor Bunnell and Engineer Kent and left Hoboken at 8:55 p.m., and passed Blair town, the last open telegraph office at 10:55 p.m. When end No. 9 approached signal 719 that signal was in the caution position, and the speed of the train was reduced. As the train approached signal 737, it was in the stop position and approximately at the time the signal was reached the train was given a stop signal by the flagman of train 1st No. 9 which in

turn had been stopped west of signal 727 by the flagman of a freight train ahead, which was being delayed on account of a drawbar having been pulled out. Second No. 9 stopped at signal 727, then immediately proceeded slowly and again stopped behind 1st No. 9, with the rear end 465 feet west of signal 727 and clear of the cut by about 165 feet. The train was approximately in this position when it was struck by 3rd No. 9.

Train 3rd No. 9 consisted of engine 1102, club car, Pullman sleeping cars Fenwood, Onida, Annapolis, Eastlake, Arthenian, Markegen and Marchmont, all of wooden construction except the club car and sleeping car Marchmont, which were of all-steel construction. It was in charge of Conductor McCarty and Engineer Anderson, and left Hoboken at 8:37 p.m., passed Blairtown at 11:04 a.m., and after passing a burning green fusee, exploding two torpedoes, passing the flagman of 2nd No. 9, and signal 727 in the stop position, and while running at a speed estimated to have been about 20 miles per hour it collided with the second section at about 11:13 p.m.

Pullman sleeping car Rembrant, the rear car of train 2nd No. 9, was derailed and its east end telescoped for about 25 feet by the locomotive of 3rd No. 9. The weather at the time of the accident was clear and the moon was shining.

Flagman Jones, of 1st No. 9, stated that when his train stopped at signal 727, he lighted a green fusee and threw it from the rear of the train. Immediately after coming to a stop the train started and proceeded slowly for a short distance, when it again stopped behind a freight train; he at once started back to

flag. He stated that he saw 2nd No. 9 approach and stop at signal 727, and then proceed, and that, after starting, the engineer of that train answered his signals and proceeded slowly. He remained on the ground walking beside the train until it stopped about 150 feet from the rear of his train; he continued walking to the rear of his own train. He stated that after 2nd No. 9 had been standing about two minutes the engineer of his train sounded the whistle to recall him and started to move forward, and as they pulled away he heard the engineer on 2nd No. 9 sound the whistle signal to recall the flagman of that train.

Engineer Kent, of 2nd No. 9, stated that as his train came in sight of signal 719 it was in the stop position, and the speed of this train was reduced, but as the train came nearer, the home signal cleared; he released the brakes and proceeded. When he came in sight of signal 727 it was in the stop position. He brought his train to a stop before passing the signal and at this point he saw a green fusee, also the flagman of 1st No. 9. He then proceeded slowly and stopped about one and one-half car lengths from the rear of 1st No. 9 at 11:03 p.m. He immediately signalled the flagman to go back and protect the rear of his train. Engineer Kent stated that after his train had been stopped about 3-1/2 minutes, 1st No. 9 started forward. He immediately recalled his flagman and while waiting for him to return, he looked back and noticed the rays of the headlight of 3rd No. 9, as it approached, but at that time thought it had picked up the flagman of 2nd No. 9 and was proceeding expecting to stop. As soon as the engine came into view he realized that it was running at too high a rate of

speed to stop in time to avoid colliding with his train. He immediately released the brakes, opened the throttle and had just succeeded in getting his train started when the collision occurred. Engineman Kent stated that before starting from signal 727, he knew that his train would be unable to make the usual speed through the block, as he could see the flagman of first No. 9. In response to a question he stated that had he signalled his flagman back at that time, the flagman would have had about 3 minutes more to get back a greater distance from the rear of his train. He also stated that the accident occurred at 11:10 p.m. and that about one and one-half minutes elapsed between the time he recalled his flagman and the time the accident occurred, and had he moved his train forward as soon as 1st No. 9 departed, so as to have the rear of the train on the straight track while waiting for the flagman, the accident probably would not have occurred.

Conductor Bunnell, of 2nd No. 9, stated that when his train stopped at signal 727, he was just entering the baggage car. He saw the signal in the stop position and also noticed the flagman of 1st No. 9 walking along beside his train, and spoke to him. He stated that when the train stopped at signal 727, he assumed that his flagman had gotten off and gone back. Conductor Bunnell further stated that before leaving signal 727 he could have signalled the engineman to sound the whistle for the flagman to go back, but that he overlooked doing so. He also stated that his train came to a stop behind 1st No. 9 at 11:09 and that the accident occurred at 11:13.

Flagman Hull, of train 2nd No. 9, stated that when his train stopped at signal 727, he placed one torpedo about 12 feet

from the rear of the train and another one farther back; he also left a green fusee. When his train started, he rode upon it until it stopped behind 1st No. 9. Immediately upon its stopping, he proceeded back with a flag, and at about the same time the engineman sounded the whistle for him to protect the rear of his train. He ran back as fast as possible under the conditions, the track being slippery and a train passing on the adjoining track. When he first saw 3rd No. 9, he had reached a point within 30 or 40 feet of where he had placed the fusee, and at that time train 3rd No. 9 was about 1,000 feet distant. The engineman of 3rd No. 9 answered his signal when about 500 feet distant, but continued on, and was running at a speed of about 45 miles per hour when it passed him. Flagman Hull further stated that he had a full supply of fusees, but did not throw one off when the train slowed down at signal 719, where his train received a caution signal indication, as he did not think it was necessary nor that the conditions were such as to require it. He stated that he did not go back immediately upon stopping at signal 727 as he did not know why the signal was in the stop position,--whether it was out of order or there was a train in the block.

Engineman Anderson, of train 3rd No. 9, stated that when his train was about a mile east of signal 719 he thought that it displayed a green indication. As his train came nearer to the signal the smoke and steam of a train passing on the eastbound track obscured it from his view, and he was unable to see anything further until after the helping engine on the rear of the freight train had passed, and this caused him to miss the signal. He stated that as

soon as the freight train had passed, he saw the green fusee and made a service application of the brakes, making a 10 or 15-pound reduction. Almost immediately he discovered the flagman of 2nd No. 9, and signal 727 in the stop position, made an emergency application of the brakes, opened the sander and sounded the whistle, but was unable to stop the train in time to avert the collision. Engineman Anderman also stated that the brakes on his train were working in a satisfactory manner, and that at the time he passed the flagman the speed of the train was approximately 80 miles per hour. He believes that if he had had another car length of space in which to stop his train no damage would have resulted.

In measurements and tests made subsequent to the accident, it was ascertained that the green fusee placed by the flagman of 2nd No. 9 could be seen from a point 2,345 feet east of the rear of 2nd No. 9, and that Flagman Hull had reached a point 652 feet east of signal 727, and could be seen a distance of 752 feet, making a total distance of 2,097 feet from the rear end of 2nd No. 9 to the point where the flagman could be seen by the engineman of 3rd No. 9.

The direct cause of this accident was the failure of Engineman Anderman, of train 3rd No. 9 properly to observe and be governed by automatic block signal indications intended for the prevention of accidents of this character.

Special time-table rule 17 reads in part as follows:

"A signal imperfectly displayed, or the absence of a signal at a place where a signal is usually shown, must be regarded as the most restrictive indication that can be given by that signal; that is, Stop, if a stop signal, Proceed under Control, if caution signal, and the fact reported to the Superintendent."

There are several conspicuous land marks in the vicinity of signal 719, including an overhead concrete bridge about 1,800 feet west of the signal, by which the signal could be definitely located. In the event of train 3rd No. 9 passing signal 719 unaware, Engineman Anderman, when he passed under this concrete bridge, must have been cognizant of the fact that he had passed the signal without noting its indication and if at that time he had complied with rule No. 17 there would still have been ample time in which to have brought the speed of the train under control in season to avoid the accident.

It would also appear that, with the flagman in a position where he could be seen from a point 2,082 feet from the rear of his train, had Engineman Anderman maintained a proper lookout, he would have seen the flagman in sufficient time to have brought his train to a stop before colliding with the rear of the second section.

General Rule 559, relating to enginemen, reads as follows:

"When from any cause an engineman is unable to proceed with his train or to maintain usual speed, so as to involve risk of being overtaken by a following train, he must immediately give the signal as prescribed in Rule 14 (c) for Flagman to go out."

Under this rule Engineman Kent, of train 2nd No. 9, knowing that there was another section following, should have signalled his flagman to go back and protect the rear when his train stopped at signal 727, as at that time he saw the flagman of 1st No. 9, and knew that his train would be delayed in this block.

General Rule 457 is as follows:

"When the flagman is recalled, if there is not a clear view for at least one-half mile in the rear of that train, it must be moved ahead a sufficient distance to insure safety while waiting for the flagman."

In this instance the rear of 2nd No. 9 was still on the curve and clear of a cut by only about 165 feet, and to comply with this rule, Engineman Kent, while waiting for his flagman, should have moved his train forward as soon as 1st No. 9 had departed.

Conductor Bunnell, before passing signal 727, was also cognizant of the fact that his train would be delayed in the block and under this rule he should have seen that the flagman got off at that point and went back immediately to warn approaching trains. Conductor Bunnell was also at fault under Rule 467. When the flagman was recalled he should have signalled his engineman to move the train forward in compliance with the requirements of that rule.

All the fatalities in this accident occurred to persons riding in sleeping car Rembrandt. This car was of wooden construction and was built in 1901. Attention has been called to the superiority of all-steel passenger cars over those of wooden construction, and if Pullman car Rembrandt had been of all-steel construction, in all probability the results of this accident would have been less serious.

All the employees involved in this accident were experienced and were considered competent employees. At the time of the accident Engineman Anderson had been on duty 3 hours 17 minutes, Engineman Kent 3 hours 17 minutes, and Conductor Bunnell 3 hours 42 minutes.