

INTERSTATE COMMERCE COMMISSION

REPORT OF THE CHIEF OF THE BUREAU OF SAFETY COVERING INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE NEW YORK CENTRAL RAILROAD NEAR SCHENECTADY, N Y, ON JUNE 9, 1920

JULY 20, 1920

To the Commission

On June 9, 1920, there was a rear-end collision between a passenger train and an express train on the New York Central Railroad near Schenectady, N Y, which resulted in the death of 14 passengers and 1 employee, and the injury of 37 passengers, 5 persons carried under contract, and 1 employee. This accident was investigated jointly with representatives of the Public Service Commission of the State of New York, Second District, and as a result of this investigation I respectfully submit the following report.

The Mohawk Division, on which this accident occurred, extends between Syracuse, N Y, and Albany N Y, a distance of 147.39 miles. In the vicinity of the point of accident this division is a four-track line, over which trains are operated by time-table, train orders, and an automatic block-signal system. The automatic signals are of the three-position, upper-quadrant, normal-danger type, spaced to give an approach indication not less than braking distance in the rear of a signal which is displaying a stop indication, the average length of the blocks is about 1 mile. The accident occurred at a point about 2,100 feet east of automatic signal 16452, which is 5,003 feet east of automatic signal 16552.

The tracks are numbered from south to north as follows: 2, 1, 3, and 4, the accident occurred on track 2. Approaching the point of accident from the west there is a 1-degree 30-minute curve to the left, 2,900 feet in length, extending to within about 300 feet of signal 16452, following this curve the track is tangent to the point of accident, a distance of about 2,450 feet. Illustration No. 1 is a view of signal 16452 from the east end of curve. The grade is slightly descending for eastbound trains. The weather at the time of the accident was clear.

Eastbound passenger train No. 28 consisted of 1 express car, 1 mail car, 1 baggage car, 2 coaches, and the Pullman sleeping cars Wadsworth and Floumond, in the order named, hauled by engine 3389,

and was in charge of Conductor Flynn and Engineman Hogan. All of the cars in this train were of steel construction except the express car, which was of wooden construction. Train No. 28 left Syracuse at 8 15 p. m., and on its arrival at Utica it was necessary to make repairs to the brake pipe under the tender. The train departed from Utica at 10 17 p. m., 24 minutes late, passed signal station 11 at 12 19 a. m., 32 minutes late, and was brought to a stop east of signal 16452, and about 5 miles east of signal station 11, by an application of the air brakes caused by the defective brake pipe. While

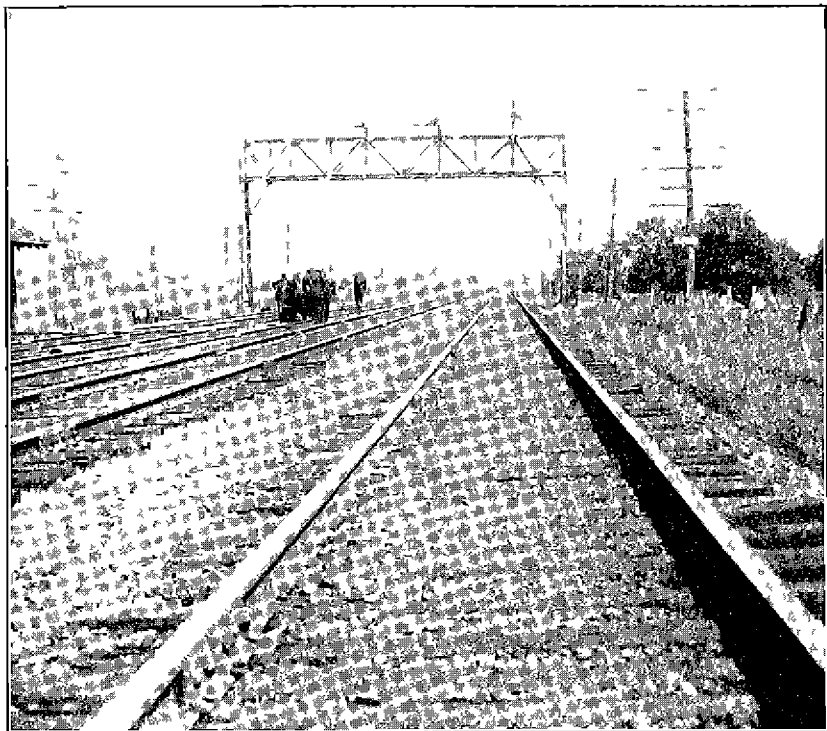


FIG. 1.—View of signal 16452 from beginning of tangent track about 300 feet west of signal.

repairs were being made, the rear of the train was struck by train No. 34.

Eastbound express train No. 34 consisted of 9 baggage and express cars and 1 coach, hauled by engine 3461, and was in charge of Conductor Merritt and Engineman Doyle. It left Utica at 10 45 p. m., 1 hour and 40 minutes late and 28 minutes behind train No. 28, passed signal station 11 at 12 23 a. m., 1 hour and 59 minutes late and 4 minutes behind train No. 28, and at about 12 29 a. m. collided with train No. 28 while traveling at a speed estimated to have been 55 or 60 miles an hour.

Train No 28 was driven ahead a distance of about 3 car lengths, in some manner the sleeping car Wandin was thrown over on its right side and came to rest in badly damaged condition on the south side of the track, the Florimond was driven under the coach, the third car from the rear, the superstructure of the Florimond being practically demolished. Illustration No 2 shows the extent to which the



FIG 2—Rear end of the Florimond and engine 3461

Florimond was penetrated by engine 3461. Illustration No 3 is a view taken from the north side of the track and shows the coach resting on the underframe of the Florimond, while illustration No 4 is a view taken from the south side of the track and shows the condition of the Florimond after the coach had been removed and after engine 3461 had been pulled back from the wreckage. Engine 3461

was not derailed or badly damaged, but the first two cars of train No 34 were demolished, the first of these was a steel underframe express car, while the second was a wooden baggage car. All of the passengers killed were in the Florimond, the employee killed was Engineman Doyle, of train No 34.

The defect in the brake pipe of train No 28 was first noticed at Oneida, 104.59 miles from Schenectady, at this point Engineman

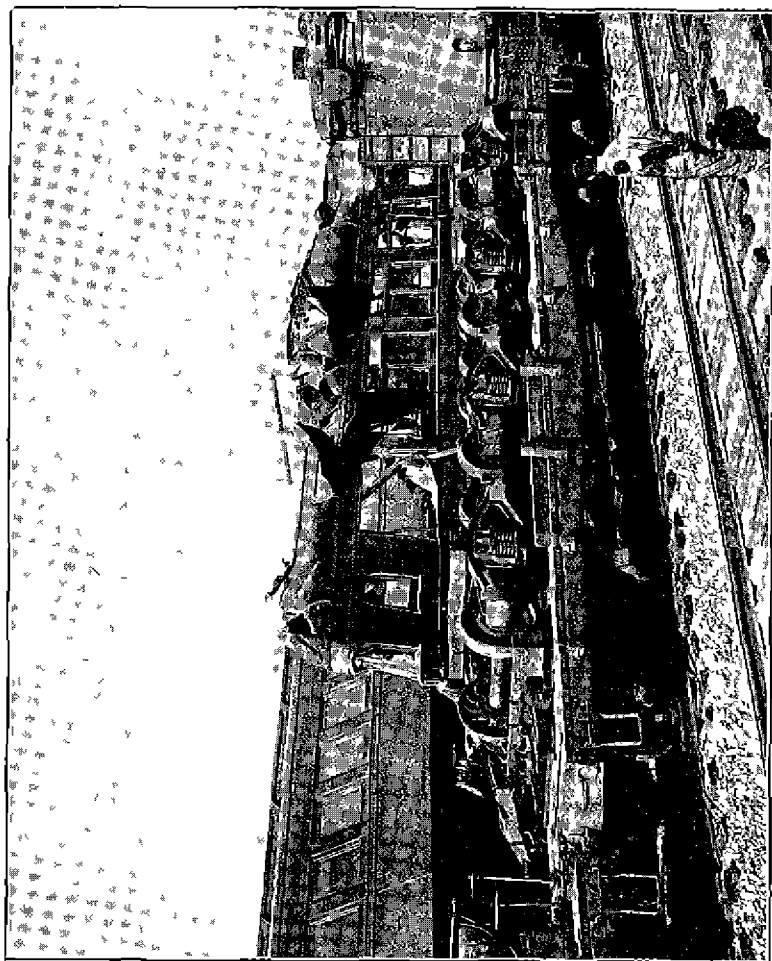


FIG. 3.—View from north side of track showing the Florimond and the coach.

Hogan discovered that there was a bad brake-pipe leak. At Rome, 91.47 miles from Schenectady, Engineman Hogan found that the leak was at a nipple in the brake pipe under the front end of the tender. Upon arrival at Utica, 77.67 miles from Schenectady, this nipple was removed, but as the inspector did not have another nipple which would fit he cut some additional threads on the defective nipple and replaced it, after which the brake pipe appeared

to be in good condition and the proper brake-pipe pressure was obtained without difficulty. No further difficulty was experienced until the brake-pipe pressure dropped as the train was passing around the curve west of where the accident occurred. By placing the brake valve in full release position the engineman kept the train moving until it finally came to a stop east of signal 16452.



FIG. 4.—View of the Flomond from south side of track

According to the statement of Flagman Robinson, of train No 28, he threw off a fusee when he noticed the speed of the train was being reduced, and he said it was still burning when his train passed around the curve out of sight. As the train stopped he looked ahead, saw that a proceed indication was displayed at the next signal, and, thinking that there was something wrong with the engine and knowing that train No 34 was following his train and running on a faster

schedule, he started back immediately, taking with him red and white lanterns, four fusees, and eight torpedoes. After he had gone back 3 or 4 car lengths he looked around to make sure that the markers were burning, saw that they were burning brightly, and then continued to go back. He had gone a distance estimated by him to have been about 25 car lengths when he heard train No. 34 approaching and saw the reflection of the electric headlight of the engine hauling that train. Flagman Robinson was not sure whether he placed one or two torpedoes on the rail but thought he only put down one torpedo, after which he lighted a fusee and ran toward the approaching train an additional distance of about 5 car lengths, jumping from the track just before the engine reached him and throwing the lighted fusee at the engine cab as it passed him. Flagman Robinson thought the engineman shut off steam at about this time, but said that he saw no movement of anyone in the cab or any sparks flying from the wheels to indicate that an application of the air brakes had been made.

The statement of the flagman in its essential features was verified by Train Conductor Flynn, Pullman Conductor English, and Baggage-master Hildreth, all of train No. 28, and L. H. Eckhart, an employee who was deadheading on train No. 28. All of these persons saw the flagman go back to flag as soon as the train stopped and saw him waving a fusee, while the Pullman conductor saw the flagman throw the fusee at the engine of train No. 34 as it passed him. Their estimates as to the amount of time which elapsed after train No. 28 stopped until the accident occurred varied from two to five minutes. None of these witnesses, or the engineman, fireman, and head brakeman, heard any whistle signal sounded by the engineman of train No. 34. There was a disagreement as to whether or not a torpedo was exploded; the baggage-master and head brakeman, both of whom were beside the tender of their engine, were positive that they heard the explosion of a torpedo, the baggage-master claiming that it was after either one or two torpedoes exploded and no whistle signal in acknowledgment of the same was sounded by the engineman of train No. 34 that he told the fireman to get out from under the tender, where he was at work on the defective brake pipe, none of the other employees of train No. 28 heard the torpedo. None of the members of the crew of this train went back to signal 16452 after the accident to see what indication was displayed.

E. C. King, who lives on a farm near the scene of the accident, was about one-fourth mile distant at the time it occurred. Mr. King heard the engineman of train No. 34 sound the whistle signal for Rector's crossing, a short distance east of signal 16552, and also for Cluett's crossing, just west of signal 16452. He thought the flagman of train No. 28 went to within 50 or 100 feet of signal 16452, and

saw a red light flying through the air, apparently striking some part of the engine. Mr. King thought that the brakes on train No. 34 were applied at about the time the train passed signal 16452, he saw fire flying from the engine wheels, but did not hear the explosion of a torpedo. He estimated that train No. 28 had been stopped not more than three or four minutes when the accident occurred. Mr. King's daughter verified his statements about the engineman of train No. 34 whistling for the two road crossings and also about not hearing the explosion of a torpedo. She saw the flagman near the signal bridge, but thought the fusee was thrown at the engine of train No. 34 from a point near the rear of train No. 28.

According to Fireman Kopp, of train No. 34, the last stop indication received was at an automatic signal just west of Amsterdam, about 12 miles west of the point of accident. This signal went to the clear position before train No. 34 reached it and the fireman said that he and Engineman Doyle figured that train No. 28 was ahead of them. The fireman said that after leaving that point all signals approaching the point of accident were displaying clear indications. The engineman was the first to see signal 16552 and called it clear, and Fireman Kopp said that he then looked at it, saw that it was clear, and called its indication to the engineman. Fireman Kopp then began to work on the fire and did not see signal 16452, but said it was called clear by the engineman. In not more than half a minute, as he was about to get upon his seat after working on the fire, the engineman called to him to jump and applied the air brakes in emergency, and on looking ahead he saw the markers of train No. 28, which he thought were a little smoky, he had only time to brace himself before the accident occurred. Fireman Kopp had not seen a flagman or fusee, or heard the explosion of a torpedo, and did not remember whether the engineman whistled for the two road crossings. He did not know of anything which could have distracted the engineman's attention from the track ahead, neither had he noticed anything to indicate that the engineman was not in normal physical and mental condition. In a later statement Fireman Kopp said it was possible that the last signal seen by him was the third signal west of the point of accident, and therefore that he had failed to see two signals, but he said that after passing the last signal seen by him the engineman called only one other signal, also that judging from the amount of time he worked on the fire he did not think there could have been two signals between the last one he had seen and the point of accident. Fireman Kopp said that Engineman Doyle usually shut off steam when passing a caution signal indication, allowing the train to drift until he could see the next signal before applying the air brakes. Under rule 703 such an indication means to "Approach next signal prepared to stop." Nearly three hours

after the accident the throttle on engine 3461 was found to be closed, the brake valve in emergency position, and the reverse lever near the center of the quadrant

Conductor Merritt, of train No 34, was riding in the rear car. He felt an emergency application of the air brakes, after which he passed a lighted fusee on the ground, but did not hear a torpedo. The train proceeded about a train length before the accident occurred. After getting off he looked back and saw a flagman about 10 or 15 car lengths west of his train. The statements of Brakeman Smith, of train No 34, added nothing to those of Conductor Merritt except that he did not notice a fusee. Flagman Peters also failed to notice a fusee, but on going back to flag after the accident he saw a flagman about 15 or 20 car lengths west of his train, and at that time also saw a burning fusee about 1 car length west of the flagman, this fusee was burning well, not having the appearance of just starting to burn. Signal 16452 was in the stop position when he reached it, he did not go back as far as signal 16552.

With the exception of the flagman, none of the crew of train No 34 went back after the accident as far as signal 16452 and they knew nothing concerning its indication. None of the train crew had heard the engineman whistle for the two crossings. All of them said that Engineman Doyle had appeared to be in apparently normal condition, also that there had been no difficulty of any kind experienced with the air brakes.

The crew of the engine which proceeded to the point of accident on track 2 for the purpose of hauling the rear of train No 34 away from the wreckage found all signals clear until they came to signal 16552, which was displaying a caution indication, while signal 16452 was displaying a stop indication, this was at about 2 15 a m. Trainmaster Williams, who had formerly been a signal supervisor, came to the scene of the accident from Utica at about 3 20 a m, and at the time of his arrival the proper signal indications were displayed. He examined the signals and locks on the mechanism cases, and at daylight examined the track circuits, he found everything apparently in perfect condition. The signals were inspected at 5 a m by Signal Supervisor Guyer and found to be in good working condition. Thorough tests were begun at about 9 a m, at which time the control circuits were found to be free from grounds, while a mechanism test failed to disclose any mechanical friction or grounds on the mechanism. On June 10 careful examination and test was made of the entire signal equipment in the vicinity of the point of accident, but nothing was found to indicate that the signals had not been working properly, neither was there any evidence that any adjustments or renewals had been made. Examination of the records showed that there had been only one false clear indication during

the period of about 12 years that these signals had been in service. That failure occurred in November, 1918, at signal 16552, and was due to broken-down insulation on a binding post of a track relay, caused by lightning. This trouble was discovered at once and repaired. There was also a false stop indication displayed by signal 16452 in August, 1918.

The defective brake-pipe nipple was removed from engine 3389 at 7 10 a. m. by an air-brake foreman, who said that it was not in proper condition to apply, while the assistant master mechanic stated that the nipple was not fit to be put on an engine. Examination of several work reports covering engine 3389 showed that all work reported had been properly attended to.

The work report covering engine 3461 on June 7 included a statement that the driving-wheel brakes would not hold. All of the work reported on this date was shown as having been attended to, and the work report filled out by the engineman who used the engine on June 8 did not include any item relating to the air-brake system. Examination of the equipment of train No. 34 showed that the coach had 12 inches piston travel, sufficient to render the brakes on that car practically inoperative. There was also a broken brake rod on the third car in the train, but it was not definitely determined that this was not broken as a result of the accident.

This accident was caused by the failure of Engineman Doyle, of train No. 34, properly to observe and be governed by automatic block-signal indications, as well as the stop signals of Flagman Robinson.

The last signal seen by the fireman was said by him to have been in the clear position, but he was not sure that this was not the third signal west of the point of accident. If that was the case, then the train passed two signals while he was working on the fire, while the engineman only called one of them. The fireman's estimate, however, of the time which elapsed between the time the engineman called the signal and the time of the accident points to the conclusion that signal 16452 was the one which was called clear by the engineman and raises a question as to whether the engineman saw signal 16552. Signal 16452 was found to be in the stop position when the flagman of train No. 34 passed it on his way back to protect his train, while proper caution and stop indications were displayed at signals 16552 and 16452 when a relief engine approached the point of accident about 1½ hours after its occurrence. In view of these facts and also in view of the fact that thorough examination and test of the signal system failed to disclose any condition which could have led to the display of false indications by these two signals, the conclusion is reached that they were displaying proper indications at the time they were passed by train No. 34. Engineman Doyle was an experienced engineman, thoroughly acquainted with the road over which he was

operating, and had not complained of not feeling well or of being in any other way unfit for duty. According to Conductor Merritt, an emergency application of the brakes was made about a train length from the point of accident, while the fireman said the engineman called to him to jump just before the accident occurred. It is apparent, therefore, that Engineman Doyle saw the preceding train when a short distance from it, but it is impossible to account for his failure to be governed by the signal indications and the stop signals of the flagman.

The evidence indicates that train No. 34 had closed up on train No. 28 to such an extent that at signal station 11, about 5 miles from the point of accident, the two trains were only four minutes apart. The evidence also indicates that neither train reduced speed at any point after passing signal station 11 until train No. 28 was brought to a stop on account of the defective brake pipe. When the time lost by train No. 28 while coming to a stop is taken into consideration, it is apparent that Flagman Robinson did not have time to go back a sufficient distance properly to protect his train. While the evidence is conflicting as to whether or not he used any torpedoes, it seems clear that he went back as far as he could reasonably be expected to go in the time available, and that no attention was paid to the stop signals given by him with a lighted fusee.

Engineman Doyle was employed as a fireman in 1890 and promoted to engineman in 1898. In 1904 and again in 1911 he had been suspended for responsibility in connection with rear-end collisions. His record since 1912 was clear. At the time of the accident he had been on duty about 6½ hours, after having been off duty about 36 hours.

This accident again directs attention to the need for an automatic train-control system by means of which a train can be brought under control when for any reason the engineman fails to observe and obey automatic block-signal indications. This subject was discussed in the report covering the investigation of the accident which occurred on this railroad near South Byron, N. Y., on January 12, 1919, and the following statements were made:

As has frequently been pointed out in previous reports of this bureau, the proper field for an automatic train control system is for use in connection with automatic block signals, and the function of automatic train control apparatus is primarily to compel obedience to fixed signal indications. The record of railroad accidents during the past several years shows that a comparatively large percentage of the most serious and disastrous railroad accidents have resulted from the failure of enginemen to observe and heed automatic block-signal indications, while in some instances other causes have contributed a considerable number of the most harrowing accidents have been attributed to that one cause alone.

Although numerous suggestions have been made and a number of them put into effect for the purpose of bringing about an improvement of railroad operating conditions, the automatic train control system is the only fundamental

and comprehensive remedy which has been advanced to meet the conditions producing such accidents, and it possesses reasonable promise of successful application for at least reducing such accidents to a minimum

This subject was also discussed in connection with the accident which occurred on the West Jersey & Seashore Railroad near Elwood, N J, on August 24, 1919, as follows

This accident again directs attention to the necessity of an automatic train-control system which will operate to control a train whenever for any cause an engineman fails to see or heed danger-signal indications. The necessity for a device of this character has been repeatedly pointed out in previous accident reports, recent reports of this nature being those upon the accidents at Fort Washington, Pa, on the Philadelphia & Reading Railroad, and at South Byton, N Y, on the New York Central Railroad. In view of the accident record of the last several years, which includes many accidents of this character on roads where the best trained and most competent men are employed, and modern signal apparatus is in use it is believed that failures of the human element in connection with train operation such as led to this accident can not be fully checked and provided against except by the use of an automatic train-control system to supplement existing automatic block signals for the purpose of compelling obedience to signal indications

Respectfully submitted

W P BORLAND,
Chief, Bureau of Safety