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## INTERSTATE COMMERCE COMMISSION

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### REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE NEW YORK CENTRAL RAILROAD NEAR FORSYTH, N Y, ON DECEMBER 9, 1923

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JANUARY 5, 1924

#### *To the Commission*

On December 9, 1923, there was a rear-end collision between two passenger trains on the New York Central Railroad near Forsyth, N Y, which resulted in the death of 8 passengers and 1 employee, and the injury of 35 passengers. The investigation of this accident was made in conjunction with representatives of the Public Service Commission of the State of New York, second district.

#### LOCATION AND METHOD OF OPERATION

This accident occurred on the Erie division, which extends between Bay View, N Y, and Collinwood Ohio, a distance of 166.18 miles, and in the vicinity of the point of accident is a four-track road over which trains are operated by time-table, train orders, and an automatic block-signal system. The tracks are numbered from north to south as follows: 3, 1, 2, and 4, tracks 3 and 1 being the westbound low and high speed tracks, respectively, while tracks 2 and 4 are eastbound tracks. The accident occurred on track 1, at a point about one-half mile east of the station at Forsyth, approaching this point from the east the track is tangent for more than 4 miles, while the grade is 0.3 per cent ascending for a distance of about  $1\frac{1}{2}$  miles.

The automatic block signals are mounted on bracket posts, on each of which are two signal masts, the posts carrying the signals for westbound movements are on the north side of the tracks, the right-hand mast carrying the signals for track 3 and the left-hand mast carrying those for track 1. These signals are of the two-arm, two-position, lower-quadrant, semaphore type, normally displaying stop indications, the night indications are red and yellow, meaning "stop, then proceed", green and yellow, meaning "approach next signal prepared to stop", and double green, for "proceed". The signals involved in this accident are signals 611 and 621, located about 6,300 feet and 1,050 feet, respectively, east of the point of accident.

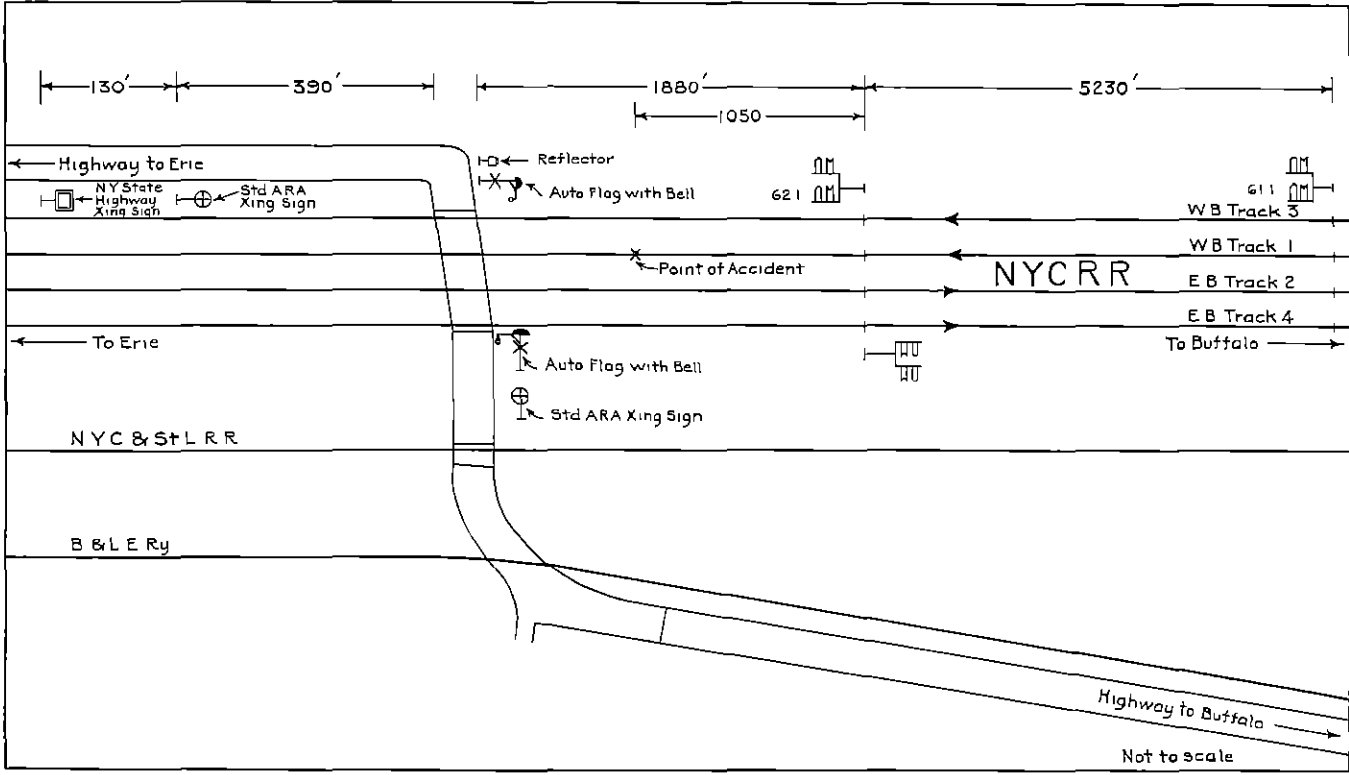


FIG. No 1—Diagram showing relative location of tracks and signals involved

Approaching the point of accident from the west, a highway on the north parallels the tracks for a distance of approximately 1,500 feet. This highway is slightly below the level of the New York Central tracks, and westward from this highway the view of the tracks is unobscured. The highway crosses the four tracks of the New York Central Railroad at an angle of  $72^{\circ}$ , and at a point nearly 1,900 feet west of signal 621. There are five warning signals governing the movement of highway traffic at this point, the first being a standard crossing sign of the State highway department, this being 520 feet from the crossing, about 390 feet from the crossing is a standard sign erected by the New York Central Railroad, indicating approach to a crossing, just beyond where the road turns to cross the tracks, and about 30 feet distant from the tracks, is a so-called wigwag signal and a crossing bell, both mounted on the same post, and operated automatically on the approach of a train from either direction. This wigwag signal is so constructed that when operated by the approach of a train it gives the appearance of a red light being swung back and forth. At this same approximate location there is also a red signal so constructed and placed that at night the rays of automobile headlights shine upon it and cause a red light to be reflected. The bell, and also the wigwag signal, begin to operate when a westbound train on track 1 is 4,384 feet from the crossing. Similar warning signals are on the south side of the tracks. At this point the single track of the New York, Chicago & St. Louis Railway is located about 85 feet south of the New York Central Railroad.

The weather was foggy and there was a light rain falling at the time of the accident, which occurred at 1:25 a. m.

#### DESCRIPTION

On the night of the accident there were three sections of the westbound Twentieth Century Limited, train No. 25, which were being operated as the second, third, and fourth sections of train No. 5. Train second No. 5 consisted of 1 club car, 7 Pullman sleeping cars and 1 observation car, hauled by engine 3288, and was in charge of Conductor Burke and Engineman Cross. It left Buffalo yard at 12:04 a. m., 10 minutes late on the schedule of train No. 25, and was approaching the highway crossing near Forsyth at about 1:10 a. m. when Engineman Cross observed two white lights, immediately after which his engine struck an automobile which was on the track, headed east and about 150 feet from the crossing. He applied the air brakes in emergency at about the time the automobile was struck and brought the train to a stop with its rear end about a train length west of the

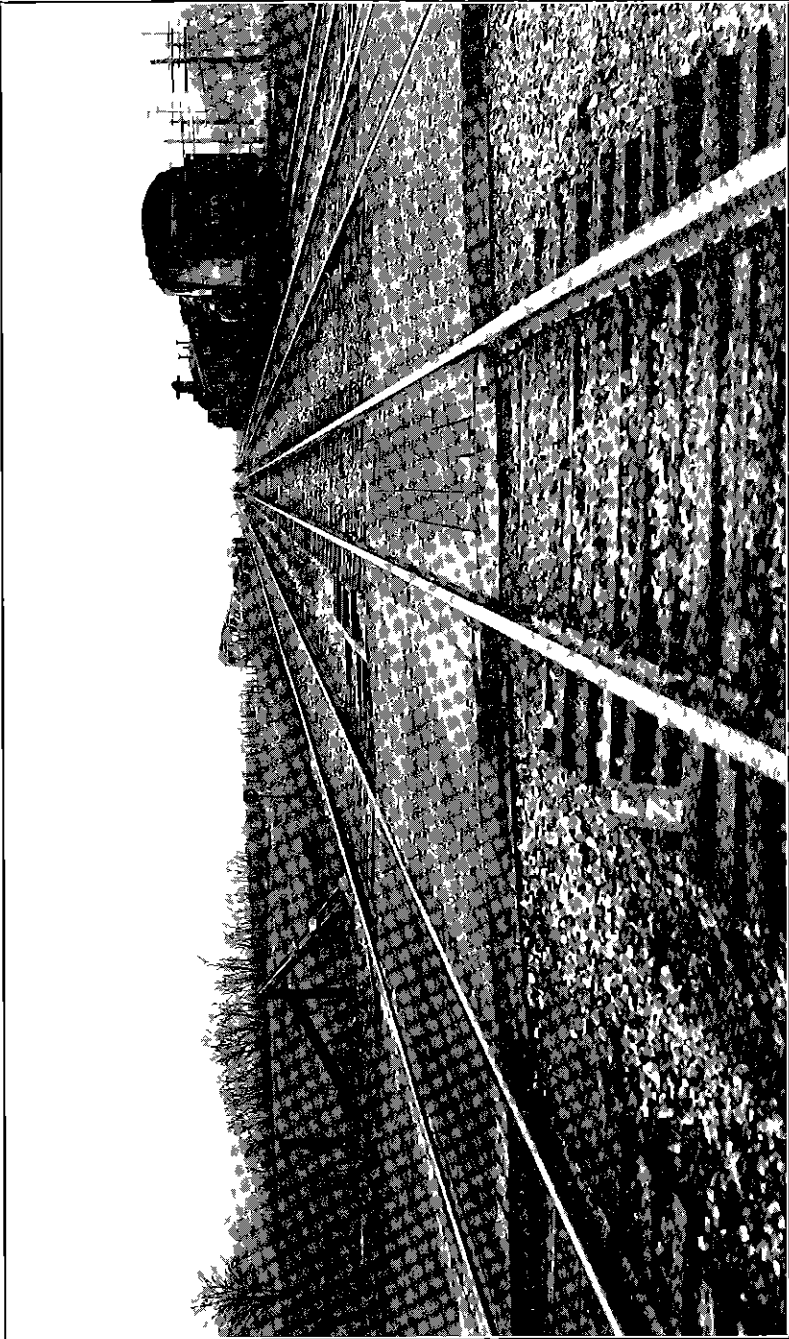


FIG No 2—View from crossing looking east toward point of accident, signal 621 in the distance

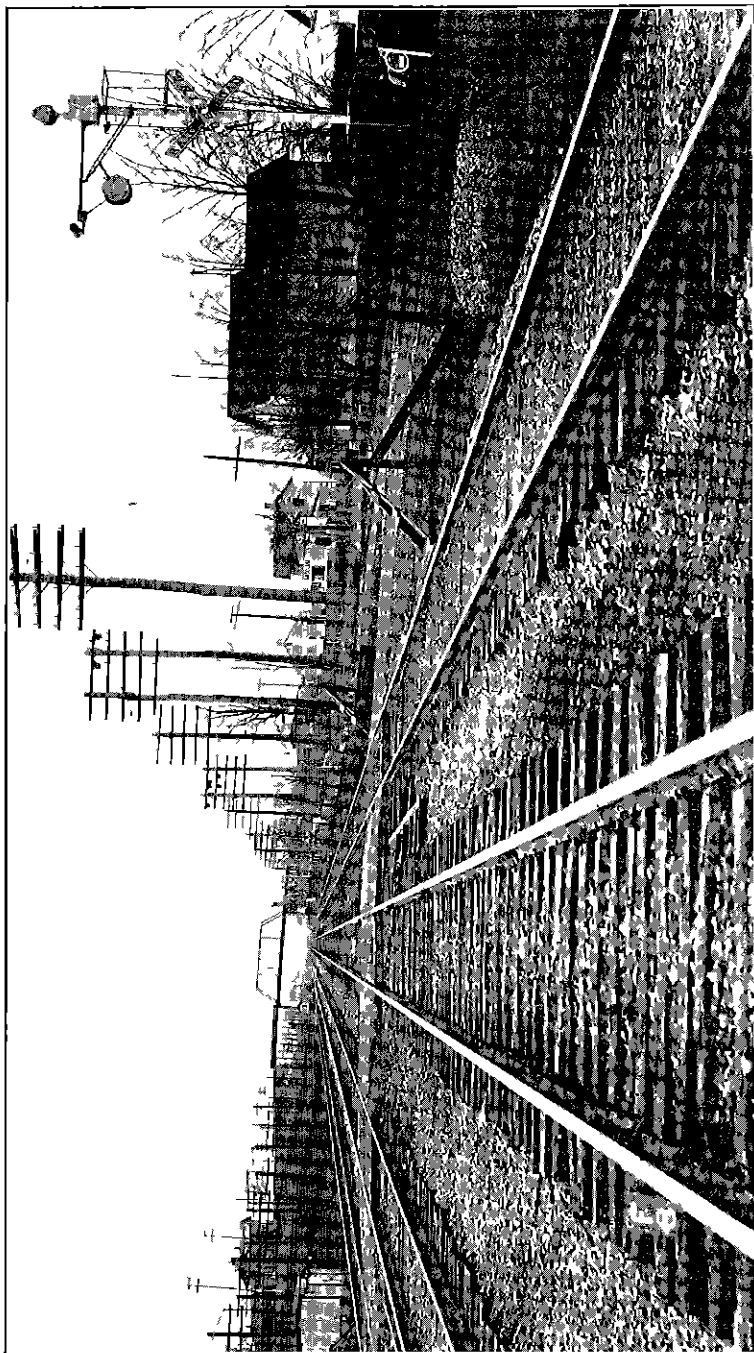


Fig No 3—View looking toward direction from which automobile approached crossing

crossing, while the flagman at once went back to stop train third No 5

Train third No 5 consisted of 1 club car, 7 Pullman sleeping cars, and 1 observation car, all of steel construction, hauled by engine 3287, and was in charge of Conductor O Donnell and Engineman Bradley. This train left Buffalo yard at 12 09 a m, reduced speed after passing signal 61 1 which was displaying a caution indication, stopped at signal 62 1 at 1 17 a m, proceeded and was flagged by the flagman of train second No 5, and after stopping to pick up the flagman it proceeded toward the crossing, where it made its third stop at about 1 23 a m, shortly after which its rear end was struck by train fourth No 5

Train fourth No 5 consisted of 1 mail car, 1 club car, 7 Pullman sleeping cars and 1 observation car, all of steel construction, hauled by engine 3316, and was in charge of Conductor Timmons and Engineman Patterson. It left Buffalo yard at 12 14 a m, passed signal 61 1 at caution, signal 62 1 at stop, passed the flagman of train third No 5, and collided with the rear end of that train while traveling at a speed variously estimated to have been from 20 to 35 miles an hour.

The rear car of train third No 5 was demolished, being telescoped practically its entire length by the car immediately ahead of it. All of those killed were in the rear car. The third car from the rear was derailed and considerably damaged. Engine 3316 was considerably damaged, but none of the cars in this train was derailed or materially damaged.

#### SUMMARY OF EVIDENCE

The automobile which was struck by train second No 5 was occupied by W S Stratford, C H Harney, and G B Maier, all of Wilkinsburg, Pa, who were en route from Pittsburgh, Pa, to Buffalo, N Y. Mr Stratford, who was driving the car, said it was so foggy he had to drive very carefully and that when he made the turn to the right to proceed over the crossing the speed was so low it was necessary to shift into second gear, just after doing which Mr Maier called to him that there was a train coming and he stepped on the accelerator. He had not turned far enough to the right when starting over the crossing, and this fact, coupled with the sudden increase in speed, caused the car to go to the left and the forward pair of wheels to drop off the left side of the crossing. Mr Stratford then shifted the gears into reverse, but the rear wheels did not obtain traction on the wet crossing planks, which were between the rails of each track, and he again shifted the gears into forward motion and apparently tried to steer the car across the rails. He saw that the headlight of the approaching train was close,



FIG No 4—Wreckage of rear car of train thrd No 5

and jumped from the automobile, which was still moving eastward. Mr. Stratford further stated that he did not know the road turned at this point, and had not heard the crossing bell nor had he seen the red crossing lights. Mr. Maier said that after making the turn to proceed over the crossing it was necessary to shift the gears and that in some manner the head end of the automobile swerved to the left and headed eastward toward the approaching train. Afterwards he heard the crossing bell ringing, but said that prior to the accident he had not heard the bell nor had he seen the swinging red lantern or the other warning signals placed near the crossing. Mr. Harney said he was about half asleep as the automobile approached the crossing and that his first knowledge of anything wrong was when he saw the headlight of an approaching train and felt the automobile bumping along on the track.

Engineman Cross, of train second No. 5, said he whistled for the crossing and shortly afterwards saw two white lights, these being the automobile headlights, apparently about 100 or 150 feet ahead of his engine. The speed of his train was then about 60 miles an hour and he at once applied the air brakes in emergency, he fixed the time of this accident at 1 09 a. m. His statements were corroborated by Fireman Houser. The members of the train crew said they found wreckage of the automobile at various points east of and close to the crossing, indicating that it must have been some distance from the crossing when it was struck. Conductor Burke and Flagman Davis said it was 1 10 a. m. when the accident occurred, while the flagman also said that he heard train third No. 5 stop at signal 62 1, whistle off, and then proceed, and that he flagged it with a lighted fusee, at about 1 17 a. m., after doing which the train again pulled ahead and stopped at the crossing.

Engineman Bradley, of train third No. 5, said he was able to see signals a distance of approximately 100 feet, although at times the range of vision would be 8 or 10 car lengths. The speed of his train was about 70 miles an hour when he saw signal 61 1 displaying a caution indication, and as the engine passed the signal he made an application of the air brakes and then shut off steam, he released the brakes at a point he estimated to have been about one-fourth mile east of signal 62 1, by which time the speed of his train had been reduced to 10 miles an hour, and when he saw that signal displaying a stop indication he made another application of the air brakes and brought his train to a stop, whistled off, and proceeded slowly until he saw the flagman of train second No. 5 giving him stop signals with a lighted fusee, this being at a point about 10 car lengths west of signal 62 1. After stopping to pick up the flagman, and finding out the nature of the trouble, he again proceeded and stopped just east of the highway crossing. He did not



know at what time his train made this last stop, but estimated that it had been standing about two minutes when it was struck by train fourth No. 5. His statements were practically corroborated by those of Freeman Batt.

Conductor O'Donnell, of train third No. 5, estimated the speed to have been about 50 or 55 miles an hour when the brakes were applied in the vicinity of signal 611, speed was reduced to a low rate, and his flagman threw off a lighted fusee. He was in the club car when the train stopped at signal 621 at 1:17 a. m., and on looking back he saw a lighted fusee at the rear of his train. As soon as the train had stopped the engineman whistled off and started ahead, stopped to pick up the flagman of train second No. 5, and finally stopped at the crossing at 1:23 a. m. On descending to the ground Conductor O'Donnell was able to see the reflection of a fusee in the hand of his flagman and also the markers on the rear of his train, and he said his train had not been standing more than two minutes when it was struck by train fourth No. 5.

Flagman Ackerman said that as his train reduced speed when passing signal 611 he threw off a lighted, 10-minute, red fusee this being at a point about 30 car lengths east of signal 621, at which signal his train was brought to a stop at 1:17 a. m. He got off and on looking ahead was able to see the stop indication displayed by signal 621, but he said that the train started almost immediately, moved about a train length and stopped to pick up the flagman of the preceding train. Flagman Ackerman then started back a second time but said that after he had gone back about  $1\frac{1}{2}$  car lengths the engineman whistled off and that he again boarded the train, this time as it was moving. After it had pulled ahead a distance which he estimated to have been about five car lengths the train stopped for a third time, at 1:23 a. m., and Flagman Ackerman said he at once started back and had gone about two car lengths when he heard train fourth No. 5 approaching, lighted a five-minute fusee, and ran toward the approaching train. No acknowledgment of his stop signals was given and he said he stepped off the track on the engineman's side and threw the fusee at the engine as it passed him, working steam, at a speed of 48 or 50 miles an hour. He did not notice anything about the engine to indicate that the air brakes had been applied, but said that at about the time the first car was passing him sparks were flying from the brake shoes, he estimated that the speed of the train had been reduced to 35 miles an hour at the time of the collision, which occurred at about 1:25 a. m. After the train had stopped he was about a car length east of its rear end, and within approximately three car lengths of signal 621.

Engineman Patterson, of train fourth No. 5, said that all signals were displaying clear indications from the time of leaving Buffalo

yard until signal 61 1 was reached. This was displaying a caution indication, which, on account of the weather conditions, he did not observe until his engine was nearly under it, moving at a speed of 45 or 50 miles an hour, and he said he then shut off steam and made an application of the air brakes. When he thought the speed had been reduced sufficiently to allow his train to drift to the next signal 62 1, he released the brakes and worked steam a little to keep the smoke of the engine from obscuring the signals. He said he was unable to judge his speed at the time he released the brakes, that he approached signal 62 1 more quickly than he had expected, in fact, very soon after releasing the brakes, that he had not seen a fusee and that when he saw signal 62 1 displaying a stop indication it was about two car lengths distant. At first he made only a 10-pound application of the air brakes, but just after passing the signal he saw the fusee of the flagman of train third No. 5, answered his stop signals, and placed the brake valve in the emergency position, he thought the speed of his train passing the flagman was about 25 miles an hour, and said it was not until after passing the flagman that he saw the rear end of train third No. 5, about four or five car lengths distant. Engineman Patterson said the brakes on his train were in good working order, but that he did not make an emergency application when he saw signal 62 1 displaying a stop indication because he did not want to tear the train apart on account of a broken knuckle or other similar cause. When he finally placed the brake valve in the emergency position, he was not certain whether full emergency effect was obtained. Superintendent Biogan, however, stated that in conversation with Engineman Patterson at the scene of the accident the engineman told him that at signal 61 1 he eased off on the throttle, no air-brake application being made, and that he was working steam when he saw the stop indication of signal 62 1 and the flagman's fusee.

Engineman Patterson, who is 57 years of age, said he had not had a physical examination for several years, and Superintendent Biogan said that while an employee is examined when promoted from one class of service to another, there is no other examination except one every two years for vision, color sense, and hearing, unless there has been a serious illness, in which event an examination is made before the employee is permitted to resume duty. After the occurrence of this accident an examination was made of Engineman Patterson by a company surgeon which developed that there was a slight leakage of the heart, and a blood pressure of 200 while the examining physician thought the blood pressure was a little too high for a man of Engineman Patterson's age, he did not consider it to be serious and he reported that he found no condition, mental or otherwise, which he regarded as having any bearing on the accident.

Fireman Pegler said he was working on the fire when Engineman Patterson called the caution indication of signal 61 1, that the engineman then eased off on the throttle, but that he did not think the engineman made an air-brake application. While Fireman Pegler was unable to estimate the speed, he said it had been reduced to some extent approaching signal 62 1, although he was watching for it he did not see this signal, and the flagman's fusee was his first warning of the train ahead. It was about this time that the engineman made a service application of the air brakes, and almost immediately afterwards placed the brake valve in emergency position.

Conductor Timmons, of train fourth No. 5, who was riding in the second car, said the speed was about 55 or 60 miles an hour when he felt the air brakes being applied in emergency, the speed being reduced to about 25 or 30 miles an hour at the time of the collision. He did not think there had been any service application prior to the emergency application. Immediately after the collision it occurred to him that the flagman might have been injured as a result of the sudden stop so that he could not go back to protect the train, and Conductor Timmons said he went back to the rear end, did not find the flagman, and went back a distance of about one-half mile before overtaking the flagman. When going back he noticed that the markers on the rear of his train were visible a distance of about 10 or 12 car lengths, he also stated that he saw the flagman of train third No. 5 at a point about one or two car lengths west of the rear of train fourth No. 5, the flagman then being on his way in toward his own train.

Baggagemaster Yeska was riding in the second car, while Brake-man Case and Flagman Hopper were in the observation car of train fourth No. 5. The statements of these employees were to the effect that they noticed no application of the air brakes prior to an emergency application made while the train was traveling at a speed of 50 or 55 miles an hour, although the baggageman said he thought that first there was a heavy service application, the emergency application following immediately thereafter. The head brakeman thought the train moved about a train length after the application was made, while the flagman thought it moved about 20 passenger-car lengths. On descending to the ground both the head brakeman and the flagman saw Flagman Ackerman at or just east of the rear car of train fourth No. 5. Flagman Hopper also stated that on his way back to flag he noted that the markers of his train were visible about four or five car lengths and that the stop indication of signal 62 1 could also be seen about the same distance. He did not observe any burning fusees.

Mr. F. B. Wiegand, signal engineer of the New York Central lines west of Buffalo, said that he considered the signal system modern in every way, that if the indications had been obeyed a rear-end collision of this character could not occur, that in order to check against failures of enginemen an additional device is needed, and that an automatic train-control system, properly functioning, undoubtedly would prevent such accidents. In its order of June 13, 1922, the Interstate Commerce Commission required the installation of an automatic train-control system on one passenger engine division of the New York Central lines between Albany, N. Y., and Cleveland, Ohio, and Mr. Wiegand stated that plans and specifications covering this installation were sent out for bids on November 24, 1923, to be returned on December 28, at which time the signal committee of the New York Central lines would meet to consider the bids and to make its recommendations. Mr. Wiegand further said that the specifications were for a continuous type of train control, this type being favored by the committee, which considered it to be more in keeping with an automatic block-signal system in that enginemen are constantly advised as to the condition of the track ahead, and also advised immediately of any change in its condition, such as an open switch, but Mr. Wiegand also said that under the circumstances as they existed at the time of the rear-end collision here under investigation the continuous type probably would not have been better than the intermittent type.

The crossing at which the automobile was struck has been the scene of several accidents, and a petition was filed with the public service commission by the State commission of highways, under date of January 14, 1922, asking that it be changed. The proceedings before the public service commission were enlarged to include two other crossings, located 700 and 2,000 feet west of the one here involved, and an order was issued by the public service commission under date of June 14, 1922, requiring the erection of a bridge 170 feet in length spanning the tracks of the two railroads. The distance from the center line of the New York, Chicago & St. Louis track to the southern edge of their right of way is 50 feet, the proposed plan called for the erection of a concrete abutment at a point approximately 10 feet south of the center line of the track, and on October 2, 1922, the New York, Chicago & St. Louis Railroad filed a petition asking for a rehearing and for a modification of the order, claiming that the bridge should span their entire right of way. The petition for a rehearing was granted, but the public service commission, after the rehearing, refused to modify its original order. The matter was then taken into court and the crossing at grade is in use pending final determination of the matter.

## CONCLUSIONS

The automobile which was struck by train second No 5 was demolished, but otherwise there was no serious damage resulting directly from this crossing accident. As a consequence of this accident, however, the passenger train which struck the automobile was stopped, which required the two following sections also to be stopped. The automatic block-signal system was adequate to enable these stops to be made safely provided the signal indications were obeyed by the enginemen of trains third and fourth No 5, and as was done by the engineman of train third No 5.

This accident was caused by the failure of Engineman Patterson, of train fourth No 5, properly to observe and obey automatic block-signal indications.

According to the statement of Engineman Patterson himself, signal 611 displayed a caution indication when he passed it, under the rules this required him to approach the next signal prepared to stop. However, the weight of evidence clearly establishes the fact that Engineman Patterson did not materially reduce the speed of his train at or near the distant signal. Signal 611 is located approximately 1 mile east of signal 621, which provided ample opportunity for Engineman Patterson to bring his rapidly moving train under such control as to enable him to stop it before passing signal 621 when he saw that signal displaying a stop indication. At the hearing in this investigation Engineman Patterson stated that it is his practice on fast passenger trains, when a caution signal indication is received, not to continue running at full speed but to ease off, allowing the preceding train to get far enough away to permit the signals to clear for his train. In this case, Engineman Patterson stated he was unable to judge the speed of his train on account of foggy weather, and he ran through the block more quickly than he expected. In any event, he apparently did not make any attempt to control his train so as to be prepared to stop before passing the next signal, when he saw the stop signal and applied the brakes his train was running at such speed that it overran the stop signal more than a thousand feet and collided with the standing train with great force. However, Engineman Patterson was fully aware of the weather conditions, which in a measure obscured the view of signals, as he said he did not see signal 611 until he was nearly under it. In view of this fact, had he intended to heed the indication to "approach next signal prepared to stop," he should at once have begun to reduce speed so as to bring his train under such control that it could be stopped within his range of vision. Engineman Patterson has been in the service of this railroad for many years and is experienced in

running high-speed passenger trains there was no evidence of illness, physical infirmity, or lack of adequate rest on his part which would serve in any way as an extenuation or explanation of his failure to obey the rule and control his train as required.

Engineman Patterson was employed as a fireman in 1890 and was promoted to engineman on December 1, 1897, he had been in passenger service for about five years. In 1904 he was disciplined for passing a signal displaying a stop indication, and he had been subjected to discipline of a minor character on a few other occasions at about that period of his experience, but his record since 1912 was good. Engineman Patterson went off duty at Buffalo at 2 a. m. December 7, and went on duty for the trip on which this accident occurred at 10 25 p. m. December 8, having been off duty 40 hours and 25 minutes, and his statements concerning what he did during his time off duty indicated that he had had sufficient sleep.

All the other employees involved were experienced men, at the time of the accident they had been on duty from 2 to 3 hours, after off-duty periods varying from 11 hours to about 48 hours.

The facts of this accident again forcibly disclose the necessity for automatic train control. This necessity has been pointed out for many years in many previous accident investigations on this and other lines. In *Automatic Train Control Devices*, 69 I. C. C. 258 docket No. 13413, decided June 13, 1922, the commission said

\* \* \*

Our investigations have shown that the art of automatic train control has long since passed the experimental stage. \* \* \*

The 15 years of investigation and study and the results obtained in the actual employment of these devices over periods of years upon some of the railroads have clearly demonstrated the practicability of and the necessity for automatic train stops or train control. The time has now arrived when the carriers should be required to select and install such device or devices as will meet our specifications and requirements. \* \* \*

The accident reports made by the railroads to us show that from January 1, 1906, to December 31, 1921, there were 26,297 head-on and rear end collisions. These resulted in death to 4,326 persons and injury to 60,682. The damage to railway property alone amounted to \$40,969,663. The annual average of these collisions amounted to 1,643, the average number killed, 270, and the average number injured, 3,792. The average damage to railroad property amounted to \$2,560,803 per year. Losses due to damage to lading are not included in these figures but they are no doubt considerable. If to the large property losses there be added the death losses and the damages paid for persons injured, the total amount will be very great. As an indication of what these latter losses are, a number of carriers have furnished us with the death and personal injury claims paid by them as a result of a number of accidents. \* \* \*

Out of a number of the roads where collisions have been investigated, as above indicated, as an illustration the commission called attention to collisions upon the following roads, resulting in deaths, injuries, and claims paid as a result thereof, as follows:

## NEW YORK, NEW HAVEN &amp; HARTFORD RAILROAD

Date	Location	Killed	Injured	Claims paid
Sept 2, 1913	North Haven Conn	21	42	\$412,210 91
Feb 22, 1916	Milford Conn	10	102	131,543 98
Mar 17, 1921	Norwood Junction, Mass	4	11	29,580 44
Total		35	205	\$73,435 33

## DELAWARE, HACKAWANNA &amp; WESTERN RAILROAD

1912	Cottuis, N Y	39	Many	\$326,133
1919	Ackerman, Pa	3	2	10 469

In 10 years from 1912 to 1922 it paid for death and injury claims a total of \$367,360, for 12 collisions, including the two mentioned. These, it is admitted, might have been prevented by an automatic train-control device.

## NEW YORK CENTRAL LINES

Date	Location	Killed	Injured	Claims paid
March, 1916	Amherst, Ohio	23	125	\$226,616 54
January, 1919	South Byron, N Y	22	183	356,178 64
June, 1920	Schenectady, N Y	15	47	201,119 50
February, 1921	Porter, Ind	37	121	173,000 00
Total		97	479	\$99,214 68

It is now more than 18 months since the commission issued its order requiring the installation on or before January 1, 1925, of automatic train control on portions of 49 different railroads among which is the New York Central Railroad. Under the law, such an order must be issued and published at least two years before the date specified for its fulfillment, but the railroad company should promptly and diligently proceed with the permanent installation of these devices which experience, costly in human life, has demonstrated are necessary to safeguard railway travel. Thus the New York Central has not as yet done

Under the New York Central rules the caution indication displayed by signal 611 for train fourth No 5 required that train to approach the next signal prepared to stop. Under the circumstances, it was necessary from the standpoint of safety that this requirement be rigidly observed, three fast passenger trains, second third and fourth No 5 left Buffalo yard within a period of 10 minutes, at 12 04, 12 09, and 12 14 a m, respectively, and passed reporting stations between that point and the point of accident within periods of from 12 to 15 minutes. The distance of 57 58 miles to Westfield was traversed by the three trains in periods of 1 hour 1

minute, 1 hour 2 minutes, and 1 hour 5 minutes, respectively, including time required for reduced speed out of Buffalo, at water pans and at Dunkirk where there was a slow order in effect. For considerable portions of this distance, therefore, high rates of speed were maintained by all of these trains. At the hearing in this investigation evidence was presented to the effect that enginemen at times continue to run at full speed under caution signal indications. This practice is not considered safe, unless and until automatic train-control devices are placed in service to enforce the observance of stop-signal indications, the railroad company should as an additional safeguard, revise its rules so as to require trains being operated at high speed to have their speed reduced to a prescribed medium rate when a caution signal is received and to approach the next signal prepared to stop.

Respectfully submitted

W P BORLAND,  
*Director, Bureau of Safety*