

INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE LINE OF THE
CHICAGO RAPID TRANSIT COMPANY

GRANVILLE AVENUE, CHICAGO, ILL.

NOVEMBER 24, 1936

INVESTIGATION NO. 2121

SUMMARY

Inv-2121

Railroad: Chicago Rapid Transit Co.
Date: November 24, 1936
Location: Granville Ave., Chicago, Ill.
Kind of accident: Rear-end collision
Trains involved: C.R.T. passenger : C.N.S. & M. passenger
Train numbers: R-5 : 725
Consist: Eight coaches : three coaches
Speed: Standing : 10 m.p.h.
Track: Practically tangent and level for $1\frac{3}{4}$ miles
Weather: Clear
Time: 6:15 p.m.
Casualties: 10 killed and 59 injured
Cause: Failure of motorman of Train No. 725 to take effective action toward bringing train under control until too late to avoid collision, coupled with lack of any system to provide for proper spacing of trains.

January 11, 1937.

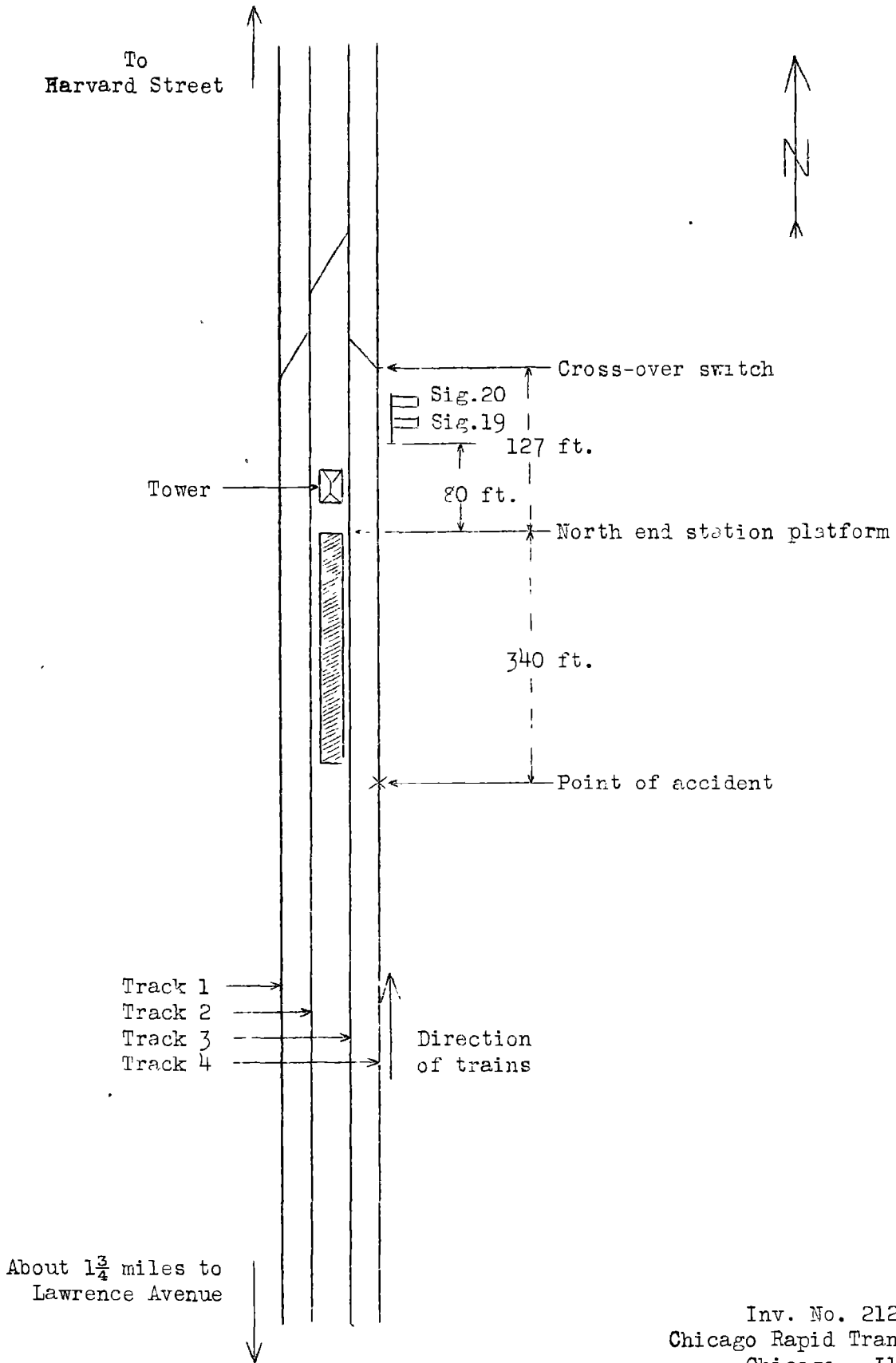
To the Commission:

On November 24, 1936, there was a rear-end collision between a passenger train of the Chicago, North Shore and Milwaukee Railroad and a passenger train of the Chicago Rapid Transit Company on the tracks of the last-named company at the station at Granville Avenue, Chicago, Ill., which resulted in the death of 10 passengers and the injury of 58 passengers and 1 employee. The investigation of this accident was made in conjunction with representatives of the Illinois Commerce Commission.

Location and method of operation

This accident occurred on the North Side Division of the Chicago Rapid Transit Company, hereinafter referred to as the L; trains of the Chicago, North Shore and Milwaukee Railroad, hereinafter referred to as the North Shore, also are operated over this division, which extends between Lake and Wells Streets, in Chicago, and Linden Avenue, in Wilmette, Ill., a distance of 14.2 miles; in the vicinity of the point of accident this is a 4-track line over which trains are operated by timetable and book of rules, and are subject to the direction of towermen at interlocking plants; one of these interlocking plants is located at Granville Avenue, just north of the point of accident. The tracks in the immediate vicinity are elevated above the street level by means of a dirt fill contained within retaining walls which rise perpendicularly; electric propulsion power for trains is supplied by means of a third rail.

The tracks are numbered consecutively from west to east, tracks 1 and 2 being for south-bound trains, and tracks 3 and 4 for north-bound trains. North-bound L express trains use track 4 to Granville Avenue and then track 3 to Howard Street, while North Shore trains use track 4 through to Howard Street. The movement from track 4 to track 3 is made by means of a cross-over, the facing-point switch on track 4 being located 127 feet north of the north end of the station platform, which is between tracks 2 and 3. The interlocking signal governing movements over this switch is located 80 feet north of the station platform and is a 2-arm, 2-position home signal of the lower-quadrant semaphore type; the top arm, signal 20, governs through movements on track 4 and the lower arm, signal 19, governs cross-over movements to track 3. There is no distant signal to indicate to motormen of approaching trains the position of the home signal. These signals and the cross-over switches, as well as the other signals and cross-overs in the vicinity, are operated from a tower which is located 31 feet north of the station platform.



Inv. No. 2121
Chicago Rapid Transit Co.
Chicago, Ill.
Nov. 24, 1936

This accident occurred on track 4, at a point 420 feet south of the home signal. Approaching this point from the south the track is tangent from Lawrence Avenue, a distance of about $1\frac{3}{4}$ miles, while the grade is practically level. The view from Lawrence Avenue northward to the point of accident is unobstructed.

The weather was clear, with good visibility, at the time of the accident, which occurred about 6:15 p.m.

Description

Train R-5, a north-bound L express passenger train, consisted of eight coaches and was in charge of Conductor Florczak and Motorman Correll. The sixth and seventh cars were of steel construction, the first, second, and fifth cars were of steel-underframe construction, and the third, fourth, and eighth cars were of wooden construction. This train passed Lawrence Avenue about 6:10 p. m. and had just been stopped at the home signal at Granville Avenue when it was struck by Train No. 725.

Train No. 725, a north-bound North Shore passenger train, consisted of three coaches, all of steel construction, and was in charge of Conductor Smedburg and Motorman Grooms. It passed Lawrence Avenue at 6:13 p. m., 14 minutes late, and was running at a speed estimated to have been about 10 miles per hour when it collided with the rear of the L train at Granville Avenue.

The first six cars in the L train were not derailed and none of them was seriously damaged; one pair of wheels of the seventh car was derailed and this car was slightly damaged; the eighth car was demolished, having been telescoped approximately 35 feet of its length by the first car of the following train. None of the cars in Train No. 725 was derailed and only the front end of the leading car was damaged to any extent. The employee injured was the motorman of Train No. 725.

Summary of evidence

Motorman Correll, of Train R-5, stated that as he passed Bryn Mawr, about 4,000 feet from the home signal at Granville Avenue, he saw signal 20 go to the stop position, and he reduced speed when about 2,000 feet distant, continuing at low speed until finally he stopped his train about 50 feet from the signal; the accident occurred almost immediately after stopping. Motorman Correll said that track conditions were good and he encountered no difficulty when reducing speed on approaching Granville Avenue. It also appeared from the statements of Motorman Correll that earlier in the evening he had observed the markers on the rear of his train and they were in good condition.

Conductor Florezak, of Train R-5, who was on the front platform of the second car in the train, said his train was diverted to track 4 at Lawrence Avenue, passing that point without stopping; after passing Thorndale Avenue, about 1,600 feet from the home signal at Granville Avenue, speed was reduced to about 5 miles per hour and the train then continued at that speed until it stopped at the signal; the collision occurred just after the stop was made. Conductor Florezak also stated that his train was about 15 minutes late.

Rear Guard Mullen, of Train R-5, said that before leaving the yard he had placed the marker lamps in their proper locations on the rear of the train and also lighted a white lantern, which was on the chain in the center at the rear end, and while en route southward he had inspected the markers and found them to be in good condition and burning brightly. After turning northward from Lake and Wells Streets only one stop was made before the train reached Granville Avenue interlocking, and it had been stopped about 30 seconds at the latter point when he heard a shrill whistle and an application of brakes, followed by the occurrence of the accident, at which time he was on the front end of the rear car. It further appeared from the statements of Rear Guard Mullen that the motorman of his train had not whistled out a flag, but was supposed to come back and let the trainmen know when the train was going to be delayed, and he did not recall that the rules provided for a whistle signal to be sounded when the flagman is to protect his train; he said he never had been required to do any flagging.

Trainman McGrath, on the front platform of the fourth car of Train R-5, said his train had just stopped when the accident occurred and that he did not feel any jar resulting from its occurrence. Trainman Harter, located between the fifth and sixth cars, said that when reporting for duty he saw the markers before they had been placed in position, and at that time they were showing bright red lights; he also stated that the speed was reduced at Thorndale Avenue to 5 or 7 miles per hour and that the train then drifted to Granville Avenue, and that he heard whistling just after the stop, followed immediately by the occurrence of the accident. Statements of Trainman Hanson, located between the fourth and fifth cars in Train R-5, and Trainman McLaughlin, between the second and third cars, added nothing of importance.

Motorman Grooms, of Train No. 725, said he took charge of his train at Roosevelt Road, which is on another division of the L, and at that time he made a test of the air brakes by applying them and having a man alongside the train examine the brake pistons, and he said the brakes were in good operating condition. On account of heavy traffic, his train was 15 minutes late when arriving at the station at Wilson Avenue on the north-bound trip on which the accident occurred. When approaching Lawrence Avenue he reduced speed to 12 or 14 miles per hour and after passing that point he increased the speed to 40 miles per hour. He said he saw the red signal at Granville Avenue when about half way between Lawrence Avenue and Granville Avenue, and began applying the brakes, gradually building up to a 20-pound reduction, and at this time, when about 4,000 feet from Granville Avenue, he saw the L train ahead of him and thought it was standing at the time. The wheels under his train began to slide when about 2,000 feet from Granville Avenue, and he said he at once released the brakes and applied enough power to cause the wheels to revolve; he then shut off the power and again applied the brakes, at which time he was about 1,700 feet distant, making a 5-pound reduction and gradually building it up to a 20-pound reduction, thinking that he had ample distance within which to stop, but the wheels again began sliding when within about 500 feet of the train ahead and shortly after-wards he moved the brake-valve to emergency position. Motorman Grooms was unable to state how fast his train was traveling at this time, but said he realized he would not be able to stop, and applied the sand and sounded a succession of short blasts on the whistle. He reversed the power when from 300 to 400 feet from the standing train, but it did not do any good, and he said he stepped out of his compartment just before the accident occurred. Motorman Grooms could not estimate the speed of his train at the time of the accident, and was unable to explain the sliding of the wheels unless it was because the rails were greasy on account of oil having dropped from passing trains. He also stated that he had not been confused in any way by the indication of a signal on track 4 about 1,000 feet north of Granville Avenue. Motorman Grooms further stated that the weather was clear, with no condition which would interfere with visibility, but that he had no recollection of seeing the red markers or white lantern on the rear of the standing train. Motorman Grooms also said he first saw the L train when he was about opposite a large electric sign which he thought was about 4,000 feet distant; however, this sign was only about 2,600 feet from Granville Avenue. Motorman Grooms further said he was in good health, had had ample rest on the previous night, and had nothing on his mind to distract his attention from his work. The North Shore required him to pass a physical examination annually and also at times when returning to duty after periods of sickness, and he had last passed such an examination in March, 1936.

Conductor Smedburg, of Train No. 725, said that after leaving Lawrence Avenue he was in the smoking compartment in the head end of the first car. He felt the brakes being applied in emergency, stood up and hastily looked out of the front window, and saw a red light to the right of his train which he thought was the home signal at Granville Avenue; as it appeared that his train would be stopped he withdrew his attention from the situation ahead, but he had hardly done so when the motorman sounded several blasts of the whistle, and Conductor Smedburg looked ahead again and saw the left marker of the standing train. By this time the motorman had reversed the power and Conductor Smedburg at once told the passengers to go back to the rear of the car, following them as they did so, and he said he had just cleared the smoking compartment when the accident occurred. Conductor Smedburg thought the speed was about 30 miles per hour just prior to the brake application and about 10 miles per hour at the time of the accident. It was the opinion of Conductor Smedburg that the wheels had slid during the efforts of Motorman Grooms to stop, because of the fact that when the train was moved back to Wilson Avenue after the accident, there were flat spots on the wheels which he had not noticed prior to that time.

Trainman Ellis, of Train No. 725, had deadheaded earlier in the afternoon with Motor ¹¹⁸⁷Grooms, had talked with him, and considered him to be mentally and physically fit. Trainman Ellis thought the speed was about 35 miles per hour prior to the emergency brake application. Trainman Donnelly, also of Train No. 725, agreed with the conductor as to the speed at the time of the accident. Motorman Challenger, an employee of the North Shore who was deadheading on Train No. 725, was in the rear car; according to his statements, the train was traveling at a speed of about 35 miles per hour, the usual speed in this vicinity, when the brakes were applied in emergency, followed within a few seconds by the reversal of power, the collision occurring immediately afterwards. After the accident Motorman Challenger handled the North Shore train from the point of accident back to Wilson Avenue and he said that at that time the rails were in good condition; this was confirmed by Motorman Clark of the L, who passed Granville Avenue at 5:37 p. m., and said he had no difficulty in reducing speed prior to passing through the cross-over from track 4 to track 3.

Towerman Gadke, on duty at Granville Avenue, said the express status of north-bound L express trains terminates at Granville Avenue and that they are switched over to track 3 at that point. On the night of the accident there was a local train ready to leave on track 3 prior to the arrival of Train R-5, which was late,

and he therefore permitted it to proceed, but it was stopped on the interlocking plant because of an adverse signal indication at Devon Avenue, the second street north of Granville Avenue, with the result that when Train R-5 arrived on track 4 he could not cross it over to track 3, and he said that train was just coming to a stop on track 4 when it was struck by the North Shore train.

Towerman Gallipo, on duty at Lawrence Avenue, said Train R-5 passed that point at 6:10:30 p. m., according to his recollection, while the North Shore train passed at 6:13 p. m., according to the train sheet; no record is kept of the passage of L express or local trains between 5:10:30 p. m. and 7:59 p. m. Towerman Gallipo also said it is a part of his duty to check the markers of passing trains and he was positive that both of the markers on the rear of Train R-5 were burning red when that train passed his station.

Instrumentman O'Reilly, employed by the L, said that he found one of the markers which had been on the rear of Train R-5 and that apparently it was in good condition; the top cover was loose, however, and the ventilator and roundel had dropped out. The other marker was practically demolished.

Engineer Serzov, of the L. shop department, said that in a test of the air brakes on the first car in Train No. 725, made on November 27, the piston travel was found to be $4\frac{1}{4}$ inches, while a maximum brake-cylinder pressure of 58 pounds was obtained from a service application and a pressure of 69 pounds from an emergency application. The sand box was inspected and was found to be about three-fourths full, while the sand pipes delivered sand to the rails when the sand valve was opened. Superintendent of Shops and Equipment Daus, also of the L, said that inspection of the two undamaged cars of the North Shore train on the day following the accident showed that the piston travel and brake-cylinder pressures were similar to those of the first car, and in addition he said there was nothing wrong with the brake rigging. There were 2 or 3 small slid-flat spots on each wheel, the maximum length of these spots being $7/8$ inch, and in his opinion spots of this size would result from the wheels having been sliding for a distance of about 100 feet on a good rail. Superintendent Daus reached the scene of the accident shortly after its occurrence and examined the rails south of the point of accident by means of a flashlight, but found no traces of oil or grease, although there was evidence that sand had been used. There were marks on the rails, caused by sliding wheels, which extended a distance of about 250 feet, indicating to him that the wheels of Train No. 725 had been sliding for a distance of about 100 feet, and from this condition he judged that the reversal of power by the motorman took place at about that distance from the rear of Train R-5, saying that at speeds below 30 miles per hour reversal of motors

with the brakes fully applied would stop the rotation of the wheels.

General Superintendent of Transportation Hardin, of the L, said he reached the scene of the accident about 6:50 p.m., and on walking back about half way to the station at Thorndale Avenue, or a distance of about 600 feet, he saw skid marks on the rails, but there was no evidence of grease or oil, and he considered the rails to be in perfect operating condition.

General Manager Johnson, of the L, said that much of the trackage of the North Side Division is unprotected by signals or other safety devices and that, since the rules to a great extent relieve trainmen from protecting their trains by flag, the full responsibility for collisions is placed upon the motormen of following trains, this being particularly necessary on account of the very short interval between trains at certain periods of the day, as many as 73 trains being scheduled in 1 hour. During foggy or stormy weather, however, fog orders are issued which relieve crews of the necessity of making time and require them at all times to be able to stop within their range of vision. Mr. Johnson said that under this system of operation only three passengers have been killed in train accidents over a period of 16 years, none of these having occurred on the North Side Division. North Shore trains have been operated since 1919, and Mr. Johnson said this was the first accident in which one of these trains had been involved.

Examination of the track by the Commission's inspectors on the morning following the accident disclosed conditions substantially as described by various witnesses; there was an abrasion on the running surfaces of the rails, nearly continuous, which began at a point 240 feet south of the point of accident and extended to within a few feet of the point of accident; the rails at that time were in excellent condition, with no evidence of oil or grease. Inspection of the brake equipment on the cars composing the North Shore train also confirms the statements of witnesses that the brakes were in good condition and it was noted particularly that there were flat spots approximately 1 inch in length on each wheel of the three cars in the train.

On the night of November 30 tests were made, using an 8-car L train and a 2-car North Shore train, composed of the same type of equipment as was in use on the night of the accident. The temperature, weather, visibility and condition of the rails were similar to the conditions prevailing at the time of the accident. With the L train stopped near the signal at Granville Avenue, the North Shore train approached it at an estimated

speed of 40 miles per hour and then an emergency application of the brakes was made at a point approximately 2,600 feet south of the rear of the L train, this application stopping the North Shore train within a distance of 743 feet. In a second test, made at an estimated speed of 45 miles per hour, the North Shore train was stopped with a service application of the brakes within a distance of 1,132 feet. During these tests it was noted that the indication of an automatic signal approximately 1,000 feet north of Granville Avenue could be clearly distinguished when from one-half to three-quarters of a mile south of the rear of the L train, and that this indication, a green light, appeared as if it were located directly above the red marker on the rear of the L train, with the result that it could easily have been mistaken for the indication of the 2-arm signal at Granville Avenue when the latter signal is displaying an indication for a through movement on track 4.

The markers used on L trains are oil-burning lamps, with white corrugated lenses, and there are two frames on the inside, one containing a red roundel and the other a green roundel, interposed between the flame and the lens. One of the markers on the rear of Train R-5 was badly damaged, only the fount and the burner being intact, while the other was only slightly damaged; examination of the last-mentioned marker showed that the red roundel was missing from its frame as stated by Instrumentman O'Reilly but otherwise in good condition. Each of the burners was supplied with an ample wick, and these were still impregnated with kerosene.

Discussion

Under the L rules, which govern the operation of North Shore trains in this territory, it is provided in rule 54 that the responsibility for safe running rests entirely with the motorman and that no collision with a preceding train will be excused; in rule 83 it is provided that when following a train the motorman must keep at such a distance and run at such a speed as will enable him to stop without accident should the train ahead come to a sudden stop at an unexpected place; rule 180, relative to flag protection, requires a flagman to go back only when his train is stopped between stations.

The evidence in this case shows that the signal governing the cross-over movement of the L express train from track 4 to track 3 was in stop position due to another train occupying track 3; the motorman saw this signal, reduced the speed of his train to a low rate, and then continued at low speed until finally he stopped the train a short distance from the signal; the collision occurred immediately afterwards.

According to the statement of Motorman Grooms, of the North Shore train, he also saw the signal in stop position when he was about half way between Lawrence Avenue and Granville Avenue and began to apply the brakes, building up gradually to a 20-pound reduction; at a point which he estimated was about 4,000 feet from Granville Avenue, but which actually was about 2,600 feet, he said he saw the L train ahead of him. According to his further statement the wheels under his train became locked when about 2,000 feet from Granville Avenue and he released the brakes, used power in order to cause the wheels to start revolving, and then shut off power and again applied the brakes; he said the wheels became locked a second time when he was only 500 feet from the train ahead and that he then moved the brake-valve to the emergency position, reversing the power as a last resort. Motorman Grooms had no recollection of having seen the markers on the rear of the L train, had had no previous difficulty with the brakes on his own train, and was unable to explain the locking of the wheels unless it was due to oil or grease on the rails. Other evidence, however, does not support Motorman Grooms' statements. According to Motorman Challenger, who was deadheading on Train No. 725, the brakes were applied in emergency, a few seconds later the power was reversed, and then the collision occurred; also, the statements of this motorman and several other employees on this train were to the effect that there was no application of the brakes prior to the emergency application just before the collision. Examination of the track confirmed these latter statements; marks on the rails made by sliding wheels began only 240 feet south of the point of accident. The evidence is clear that the markers on the L train were burning properly, and that the brakes on the North Shore train were in good operating condition both before and after the accident. In view of these conditions, no other conclusion can be reached than that for some unknown reason Motorman Grooms failed to take effective action toward bringing his train under control until too late to avert the accident. Motorman Grooms had been employed as ticket agent, collector and motorman at various times since 1923, his last service as a motorman having commenced in October, 1933; he went off duty in January, 1936, on account of illness, and in March was approved for duty by a doctor. He had been a student under the instruction of an L supervisor before starting to operate trains over the L and had been examined on rules and also on the physical characteristics of the line, as well as being instructed as a motorman.

Under the method of operation on this line, responsibility for collisions is placed upon motormen of the following trains; the rules require that when following a train the motorman must keep at such a safe distance and run at such a speed that he will be able to stop without an accident should the train ahead come to a sudden stop at an unexpected place. However, notwithstanding

the heavy volume of passenger traffic handled on this line, trains at certain periods during the day being operated upon less than a 1-minute headway, no means are provided to insure that trains will be spaced a proper distance apart to insure safety or to guard against errors in judgment or failures, from other causes, of employees to comply with provisions of this rule. Not only was there no block system in use on this line but in the case here involved there was no distant signal to indicate to motormen of approaching trains the position of the home signal.

All of the persons killed and most of those seriously injured were in the rear car of the L express train. This was a wooden car, with two steel cars immediately ahead of it; when the following train, made up of steel cars, collided with it the wooden car was telescoped approximately three-fourths of its length and almost completely demolished. The results in this case are substantially a repetition of what occurred in numerous cases in years past on various railroads of the country when wooden equipment was commonly used in passenger-train service. Because of disastrous experiences of this character, steel and steel-underframe cars have largely supplanted wooden cars, the percentage of wooden cars to total passenger-train cars in service having been reduced from 60.6 percent in 1915 to 10.19 percent in 1935; furthermore, in common railroad practice wooden cars are now seldom if ever used in main-line high-speed service, and are not associated in trains together with steel and steel-underframe equipment. On the L, however, 41.8* percent of the cars in service are wood, the equipment consisting of 455 cars of steel construction, 423 of steel-underframe construction, and 633 of wooden construction. Furthermore in this case wooden cars were intermingled with steel and steel-underframe cars. Extensive experience in railroad service has conclusively demonstrated the material increase in safety to employees and travelers in case of train accidents which is effected by the use of steel and steel-underframe cars instead of wooden cars, and also the great hazard to occupants of wooden cars when associated in trains with cars of steel and steel-underframe construction.

Conclusions

This accident was caused by failure of North Shore Train No. 725 to be brought under control until it was too late to avoid colliding with the train ahead, and by the lack of any system to provide for the proper spacing of trains.

Recommendations

The following recommendations are made:

1. That immediate consideration be given to the need on this line for an adequate block-signal system.
2. That wooden cars be eliminated from service as rapidly as practicable.
3. That the use of wooden cars associated in trains with cars of steel or steel-underframe construction be prohibited.

Respectfully submitted,

W. J. PATTERSON,

Director.