

Inv-2322

INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE
CHICAGO & NORTH WESTERN RAILWAY

EVANSVILLE, WIS.

JANUARY 2, 1939

INVESTIGATION NO. 2322

SUMMARY

Inv-2322

Railway: Chicago & North Western

Date: January 2, 1939

Location: Evansville, Wis.

Kind of accident: Head-end collision

Trains involved: Empty passenger equipment : Freight

Train numbers: Extra 1558 East : 599

Engine numbers: 1558 : 2585

Consist: 6 cars : 59 cars, caboose

Speed: Stopped : 8-15 m.p.h.

Operation: Timetable, train orders and automatic block-signal system

Track: Reverse curve; grade generally descending from both directions to short stretch of level track where accident occurred

Weather: Clear

Time: 11:21 p.m.

Casualties: 5 injured

Cause: Failure properly to obey signal indications and to move under proper control within yard limits.

Inv-2322

February 18, 1939

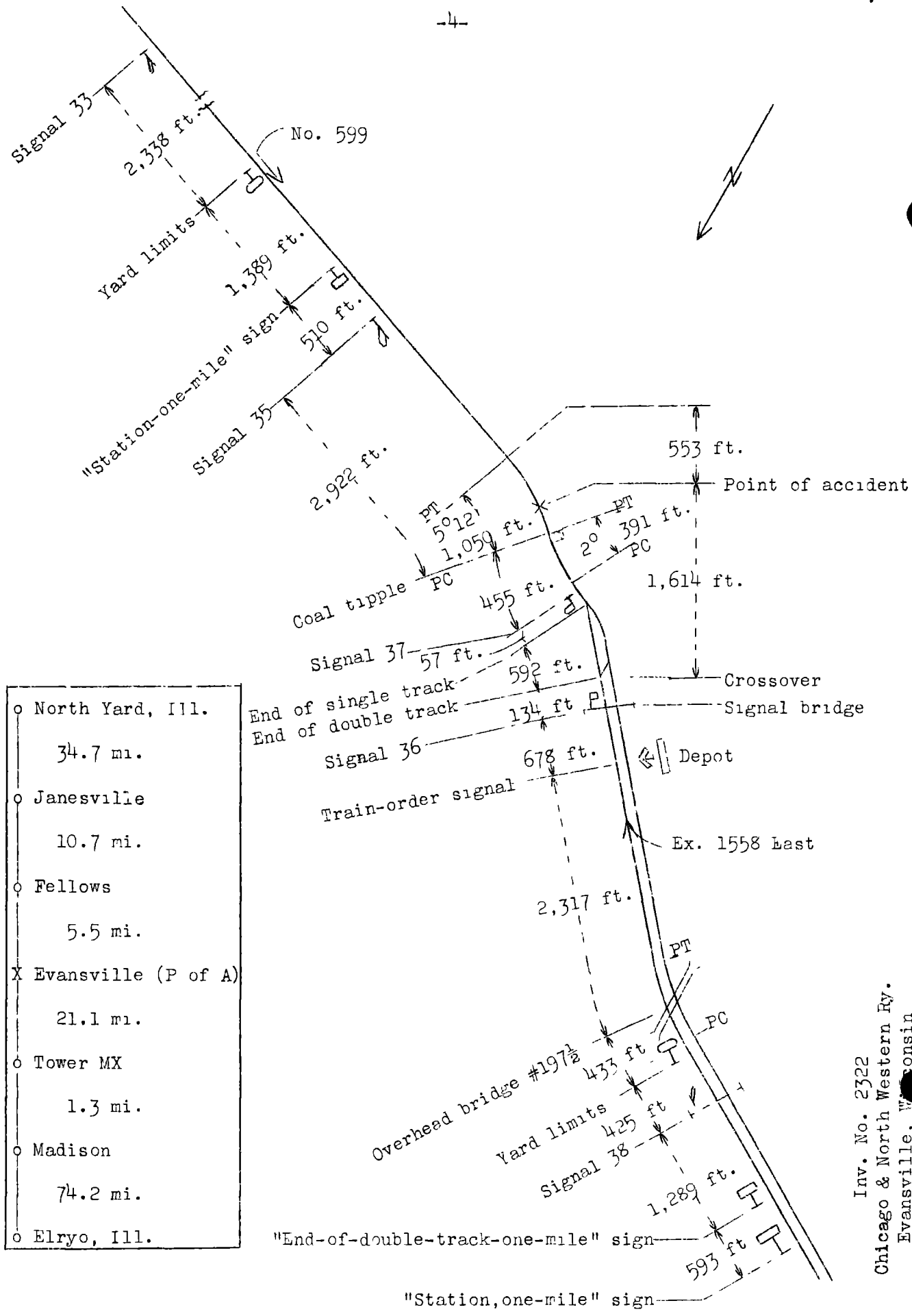
To the Commission:

On January 2, 1939, there was a head-end collision between a freight train and a train of empty passenger equipment, on the Chicago & North Western Railway at Evansville, Wis., which resulted in the injury of five employes.

Location and Method of Operation

This accident occurred on that part of the Madison Division designated as Subdivision 1 which extends between Elroy, Wis., and North Yard, Ill., a distance of 147.5 miles. Between Elroy and Evansville, a distance of 96.6 miles, this is a double-track line, the eastern end of which is 822 feet east of the station at Evansville; the current of traffic is to the left; from Evansville to Janesville, a distance of 16.2 miles, it is single track. Trains are operated by timetable, train orders and an automatic block-signal system. The accident occurred within yard limits on the single-track portion at a point approximately 2,430 feet east of the station. Approaching from the west there is a tangent 3,117 feet long, followed by a reverse curve composed of a 2° curve to the right 391 feet long, 6 feet of tangent, and a 5°12' curve to the left, 1,050 feet long, on which the accident occurred at a point 553 feet from its eastern end. Approaching from the east there is a long tangent followed by the curve on which the accident occurred. From both directions the grade is generally descending about 1 mile, the maximum gradient from the west being 0.60 percent and from the east 0.77 percent; in the vicinity of the point of accident there is level track a distance of 300 feet, on which the accident occurred at a point 39 feet from its western end. The view from either direction of the point of accident was somewhat restricted by track curvature and adjacent buildings.

A station board is located 7,492 feet west of the point of accident; also, an end-of-double-track board, 6,899 feet; automatic signal 38, 5,610 feet; the west yard-limit board, 5,185 feet; overhead bridge #197½, 4,752 feet; the station and train-order signal, 2,430 feet; automatic signal 36, 1,748 feet, the end-of-double-track switch, 1,614 feet; the end-of-single-track switch, 1,022 feet, and a coal tipple, 510 feet west of the point of accident. Automatic signal 33, the east yard-limit board, a station board, and automatic signal 35 are located 6,649 feet, 4,311 feet, 2,922 feet, and 2,412 feet, respectively, east of the point of accident.



o	North Yard, Ill.
	34.7 mi.
o	Janesville
	10.7 mi.
o	Fellows
	5.5 mi.
X	Evansville (P of A)
	21.1 mi.
o	Tower MX
	1.3 mi.
o	Madison
	74.2 mi.
o	Elryo, Ill.

Inv. No. 2322
 Chicago & North Western Ry.
 Evansville, W. Consin
 January 2, 1900

The automatic signals on both the double-track and the single-track lines are of the 3-position, upper-quadrant, semaphore type. Signals 33, 35 and 37 govern westward movements and 38 and 36 govern eastward movements. The normal position of the end-of-single-track switch is for eastward movements and when so set signal 37 displays a stop indication, and signals 35 and 33 display approach indications. When the track east of signal 36 is occupied signal 37 and signal 35 display stop indications and signal 33 an approach indication. When a westward train passes the single-track automatic westward signal located at the west end of the siding at Fellows, 5.5 miles east of Evansville, signal 36 displays a stop indication. When signal 36 displays a stop indication, signal 38 displays an approach indication, requiring that the engineman be prepared to stop at next signal and train exceeding 30 miles per hour must at once reduce to that speed.

Rules 93 and 98 of the book of rules read in part as follows:

93. All second and third class and extra trains must approach and pass all stations, yards, sidings, fuel and water stations, expecting to find trains or yard engines occupying the main track within the switches or yard limits, or taking fuel or water and will be prepared to stop unless the main track is seen or known to be clear. Trains and yard engines may use the main track at such points, protecting against first class trains in all cases and will protect against all trains where the view is obscured by fog, storms or track curvature, or other causes requiring additional safeguards.
****.
98. Trains must approach the end of two or more tracks, *** prepared to stop, unless the *** signals indicate proceed, and track is clear.
****.

The weather was clear at the time of the accident, which occurred about 11:21 p. m.

Description

Extra 1558 East consisted of six empty all-steel coaches, hauled by engine 1558, and was in charge of Conductor Enright and Engineman Qualey. This train left Madison at 10:55 p.m., according to the train sheet, passed Tower MX, the last open office and 1.3 miles beyond, at 10:58 p. m., approached Evansville, 21.1 miles beyond, at a speed estimated to have been from 50 to 60 miles per hour, passed the station board, the

end-of-double-track sign, signal 38 displaying an approach indication, the west yard-limit board, the train-order signal displaying a stop indication, signal 36 displaying a stop-and-stay indication, the end-of-double-track switch, the end-of-single-track switch, entered the single-track portion, stopped on the reverse curve at a point 510 feet east of the coal tipple and immediately thereafter it was struck by No. 599.

No. 599, a west-bound second-class freight train, consisted of 59 cars and a caboose, hauled by engine 2585, and was in charge of Conductor Brasted and Engineman Traver. This train passed Janesville, the last open office, at 10:45 p. m., according to the train sheet, 1 hour 15 minutes late; approaching Evansville, 16.2 miles distant, it passed signals 33 and 35, both of which were displaying approach indications, entered the yard limits, and when rounding the curve involved, struck Extra 1558 while traveling at a speed estimated to have been from 8 to 15 miles per hour.

The front ends of both engines were badly damaged, but the engines remained upright and locked together; the tender of engine 1558 and all the passenger cars remained on the rails. The tender of engine 2585 and the first 6 freight cars were derailed and stopped in various positions. The employees injured were the conductor and the flagman of Extra 1558, and the engineman, the fireman and the head brakeman of No. 599.

Summary of Evidence

Engineman Qualey, of Extra 1558, stated that a terminal test of the air brakes of his train of eight cars was made before leaving Chicago at 6:15 p. m.; the brakes functioned properly en route and the train arrived at Madison at 9:15 p. m. The engine was then uncoupled and serviced at the yard; it then returned and was coupled to the train and the flagman coupled up the steam, air and signal hose. On the return trip to Chicago his train consisted of six of these eight cars. A terminal test was made of the air brakes, but he did not recall having made a brake-pipe leakage test; the flagman reported the brakes to be all right. The engineman said that the air signal whistle sounded continuously; the brakeman and the flagman repaired a leak and the air whistle ceased blowing. He received train orders at Madison from the conductor who told him that their train would stop at Evansville to permit them to check the register and that No. 599 was due there about 11:35 p. m. Leaving Madison Extra 1558 made the required stop for the C.M.St.P. & P. railroad grade crossing, using the automatic brake valve, and shortly afterwards made another stop to permit the brakeman to close the main line switch. In making both stops he felt the brakes respond and he was certain that he heard the exhaust of the brake pipe and was satisfied that the brakes were functioning properly. Approaching

Evansville the fireman began to put in a fire and reminded him that their train was going to stop at Evansville, and he replied that he understood. When about 2 or 3 miles from the depot the speed was between 50 and 60 miles per hour, and the engineman made a reduction of the brake-pipe pressure but the exhaust was not as strong as it should have been; he did not feel the brakes take hold and the speed did not decrease. When the train had almost reached signal 38, which was displaying an approach indication, he closed the throttle and made a second brake-pipe reduction of 15 pounds, but again the brakes did not seem to take hold, and the speed still seemed to be between 50 and 60 miles per hour. When about 10 or 15 car lengths east of signal 38, he realized that at the rate of speed the train was traveling it would not be possible to stop at the depot. He moved the brake valve to emergency position, and again he did not get a proper exhaust and the speed was not reduced perceptibly; he then reversed the engine and applied the independent brake in addition to the automatic brake. The train-order signal was displaying a stop indication, but his train passed it at a speed of between 35 and 40 miles per hour; it passed signal 36, displaying a stop indication, and entered upon the single track; when reaching a point about four or five car lengths east of the coal tipple, at which time his train was rounding the reverse curve at a speed of about 25 miles per hour, he saw No. 599 approaching; he then jumped just before the collision occurred. He could not say whether his train had stopped prior to the collision. He said that he had been using sand since making the first brake-pipe reduction. After the accident he observed that the piston on the first car of his train was out about 5 or 6 inches, and shortly thereafter as he walked back along the train he observed that all steam hose were cut and that the steam hose, signal hose and air hose between the tender and first car were uncoupled. Before the flagman and the brakeman repaired the signal hose at Madison the brake-pipe pressure carried was 90 pounds and the main reservoir, 120 pounds. He at first thought that possibly the air hose and the signal hose had been crossed and coupled to each other in error, but he said that under such conditions only 45 pounds brake-pipe pressure would have been supplied leaving Madison and he did not think he could have either started or operated the train under those conditions. Engineman Qualey entered the service of this railroad as fireman in 1909, and was promoted to engineman in 1916. He was on the engineman's extra board until the first part of March, 1938, and since that time he has been called several times to operate passenger trains. He is a Wisconsin Division engineman, and had not operated as engineman or as fireman on the Madison Division between Chicago and Madison since 1929, but said that he was familiar with this latter territory. He was in good physical and mental condition, had obtained ample rest prior to the trip and had no worries. He said that he did everything possible to prevent the accident and

that he felt sure he knew his location approaching Evansville; the only reason he could advance for the accident was that the air brakes were not functioning properly and that he might have misjudged the speed.

Fireman Magnuson, of Extra 1558, corroborated the statement of Engineman Qualey with respect to the operation of the train up to the time of approaching Evansville. He did not remember having heard any communicating whistle signals and to his knowledge the brakes were not applied en route until approaching Evansville. He did not remember whether the engineman made the two-mile air-brake test approaching the end of double track, or whether the engine whistle was sounded. The speed was about 50 to 60 miles per hour and when about $\frac{1}{2}$ mile west of signal 38 a service air-brake reduction was made, at which time he was putting in a fire; the approach indication of the signal was called. When reaching a point about half way between signals 38 and 36 he thought the speed was not being reduced sufficiently for the time elapsed since the engineman had made the reduction; the train order signal and signal 36 were displaying stop indications. He called to the engineman to apply the brakes in emergency, and the engineman showed him that he had already placed it in emergency. The speed was being reduced at this time, but in his opinion not fast enough, it being about 30 or 35 miles per hour when passing the train-order signal; he saw the headlight of No. 599 just before his engine reached the coal tipple. The speed continued to be reduced and was about 4 to 6 miles per hour when he jumped off about 4 or 5 car lengths east of the coal tipple; his train was stopped at the time of the collision. He said that he saw fire flying from the left back driver brake shoe when passing the depot. He could not advance any opinion as to the cause of the accident, or why the brakes did not hold better than they did, taking into account the point where the engineman started to apply the brakes. He is employed on the Wisconsin Division, but had operated between Chicago and Madison and was thoroughly familiar with this district.

Conductor Enright, of Extra 1558, stated that he delivered two orders and Clearance Form A and read them aloud to the engineman, then instructed him to be sure to stop at Evansville as it was necessary to register there and to make a train register check, as No. 599 was out of Janesville and their own train would have to wait there for its arrival; he said the engineman understood. The air brakes functioned properly in making the two stops when leaving Madison. No other stops were made between Madison and the point of accident, and he did not notice any speed reductions or applications of the brakes on route. When the train passed under bridge #197 $\frac{1}{2}$ he realized that the train was not going to stop at Evansville, and he pulled twice on the communicating whistle signal, then waited a short interval and repeated the signal; each time he heard an exhaust from the valve indicating that the communicating signal was operating

properly, but the engineman evidently did not act on the signal to stop. The conductor then saw the train order signal displayed at stop; he went to the other end of the rear car and applied the air brakes in emergency by use of the conductor's brake valve, at which time the engine and at least four cars had passed signal 36. He could feel the brakes becoming applied immediately and the train began to slow down; just after it stopped the opposing train struck it. The speed was about 60 miles per hour en route, and from 40 to 45 miles per hour passing Evansville; he did not notice any application of the air brakes prior to the time he applied them in emergency. After the accident he and the brakeman parted only the steam hose between the last four coaches so that they would not freeze up; the train line and the signal line hose were not disconnected and the steam hose between the engine, tender, first and second cars were not parted. About 30 or 40 minutes after the accident he observed that the brakes on all cars were applied. The engineman, who appeared normal in every respect, told him that he was trying to stop but could not do so.

Flagman Surma, of Extra 1558, who was in the rear car, corroborated the statement of the conductor.

Brakeman McKinley, of Extra 1558, was in the first car; his statement practically corroborated that of the conductor and added nothing of value.

Engineman Traver, of No. 599, stated that the air brakes on his train were tested and functioned properly en route; the headlight was burning brightly. Approaching Evansville the speed of his train was about 35 or 40 miles per hour; signal 33 was displaying an approach indication and he eased off the throttle and made about a 10-pound brake-pipe reduction. He saw that signal 35 was also displaying an approach indication and he released the brake before reaching the east yard-limit board. The speed was about 35 or 40 miles per hour; when opposite the yard-limit board he made another brake-pipe reduction of about 10 pounds and shortly thereafter he made another of 8 or 10 pounds. As he rounded the curve he looked toward the coal tipple and the track looked clear, then he observed a headlight approaching, but thought it was a train on the track of another division. After a short time he realized that the opposing train was on the same track as his own; he immediately called a warning of danger to the fireman and the head brakeman; he applied the brakes in emergency and attempted to open the sanders at which time the speed of his train was about 15 miles per hour and his engine was about 10 or 15 car lengths from the point of the accident; the speed was somewhat reduced before the impact; he jumped just before the collision occurred. It was his intention to stop just east of the coal tipple.

Fireman Weston and Head Brakeman Van Tassel, of No. 599, corroborated the testimony of Engineman Traver in all essential details; the fireman estimated the speed at 8 to 10 miles per hour when the collision occurred.

Conductor Brasted and Flagman Brenna, of No. 599, were in the caboose. They estimated the speed at the time of the collision to be between 10 and 15 miles per hour.

Telegrapher Luckfield, at Evansville, stated that he was on the platform when Extra 1558 passed at 11:20 p. m. The speed was about 40 miles per hour, and sparks were flying from the wheels; the collision occurred at 11:21 p. m. He did not hear any engine whistle signals given by Extra 1558 as it approached and passed.

Assistant Trainmaster Yaeger stated that about 4 hours after the accident he checked the piston travel on all six coaches and all the brakes were set.

Master Mechanic Anderson stated that four days after the accident he and Road Foreman of Engines Paulus made an inspection of the wheels of engine 1558, which is of the 4-6-2 type, and of its tender, which has two four-wheel trucks. Slid-flat spots were found as follows: left No. 1 driver, none; right No. 1 driver, none; left No. 2 driver about $2\frac{1}{4}$ inches long; right No. 2 driver about $1\frac{7}{8}$ inches long; left No. 3 driver about $2\frac{3}{4}$ inches long; right No. 3 driver about $1\frac{7}{8}$ inches long; trailer wheels, none. No. 1 tender wheels had spots at different locations from $\frac{1}{2}$ to $\frac{3}{4}$ inch long; No. 2 tender wheels had several spots from $\frac{3}{4}$ to $2\frac{1}{2}$ inches long; No. 3 tender wheels had one long spot on each wheel; No. 4 tender wheels had some small spots. The indications were that these slid-flat spots had been made recently.

General Car Foreman Sicracki stated that subsequent to the accident he found slid-flat spots on the coaches as follows: first coach, one pair of wheels with small spots; second coach, three pairs of wheels with spots varying from $\frac{1}{2}$ to $1\frac{1}{2}$ inches long; third coach, all wheels spotted to about $\frac{1}{2}$ inch; fourth coach, all four pairs of wheels spotted from less than $\frac{1}{2}$ to $\frac{3}{4}$ inch long; fifth coach, three pairs of wheels spotted from 1 to $1\frac{1}{2}$ inches long; sixth coach, two pairs of wheels spotted from $\frac{3}{4}$ to $1\frac{1}{2}$ inches long.

According to the record submitted by officials, Extra 1558 passed Tower MX at 10:58 p. m., and Evansville at 11:20 p. m., consuming 22 minutes to travel this distance of 21.1 miles, or at an average speed of 57.54 miles per hour.

Observations of the Commission's Inspectors

An air-brake test made on the four rear coaches of Extra 1558 at Madison several days after the accident developed that all brakes functioned properly, the brake piston travel for each car being $7\frac{1}{2}$ inches. On account of the damage to the brake pipes on the two head cars they could not be tested.

Discussion

In the evening prior to this accident the brakes on the equipment used in Extra 1558 were tested at Chicago, and they functioned properly on the westward trip to Madison, where the engine was uncoupled and serviced, after which the engine was recoupled and the brakes on Extra 1558 were tested for the trip eastward with the empty passenger equipment and were reported all right. Before departing, the conductor told the engineman that they would stop at Evansville to check the register, that No. 599 was due there about 11:35 p. m., and that their own train would have to wait there for its arrival. Departing from Madison Extra 1558 made two stops by the use of the automatic brakes which functioned properly. Approaching Evansville the fireman began to put in a fire and reminded the engineman that their train was required to stop there. The speed was about 50 to 60 miles per hour when about 2 or 3 miles from the depot; the engineman said that he made a brake-pipe reduction, but the exhaust was not satisfactory; he did not feel the brakes take hold and the speed did not decrease. He said that when the train had almost reached signal 38, which was displaying an approach indication, he closed the throttle and made a second reduction of 15 pounds, but the brakes did not seem to take hold, and the speed still appeared to be between 50 and 60 miles per hour. After passing signal 38 he realized that at the speed the train was traveling it would not be possible to stop; he moved the brake valve to emergency position, but the exhaust was not satisfactory, and he then reversed the engine and applied the independent brake in addition to the automatic brake. The engineman said that sand was being used all the time beginning prior to making the first reduction approaching Evansville. The engineman of Extra 1558 had not operated either as an engineman or as a fireman on the Madison Division between Chicago and Madison since 1929, but he said that he was familiar with this territory. The engineman appeared to be in normal condition, and he said that his mental and physical conditions were all right, that he felt sure that he knew his location approaching Evansville, and the only reasons he could advance for the accident were that the air brakes were not functioning properly and that he might have misjudged the speed. The testimony of the fireman was similar to that of the engineman as to how the train was handled approaching Evansville.

The conductor, flagman and brakeman did not notice any application of the brakes as their train was approaching Evansville and the conductor said that when Extra 1558 passed under the overhead bridge he realized it was not going to stop at Evansville; he pulled twice on the communicating whistle signal, waited a short interval, and then repeated the signal, but the enginoman evidently did not act on the signal to stop. Shortly afterwards the conductor applied the brakes from the rear coach by means of the conductor's emergency valve, at which time the engine and at least four cars had passed signal 36; the brakes responded immediately and the train stopped; then it was struck by the opposing train.

After the accident it was observed that the brakes were applied on all six coaches. When passing the depot the fireman saw fire flying from the left back driver brake shoe on the engine and the telegrapher at that point saw sparks flying from the wheels; after the accident inspection revealed that there were slid-flat spots on wheels of the engine, tender and all six coaches. Therefore, it is apparent that the air brakes were operating on this train.

The investigation disclosed that Extra 1558 travelled the distance of 21.1 miles between Tower MX and Evansville in 22 minutes, or at an average speed of 57.54 miles per hour, ran a distance of nearly half a mile beyond the station at Evansville where a stop was required and was not controlled in accordance with signal indications which were displayed for that train. The investigation failed to develop information in support of the engineman's contention that the brakes failed to function properly.

Rule 93 required both trains, at the point of accident, to protect against all trains where the view was obstructed by track curvature; this accident occurred on a reverse curve 1,447 feet in length, at a point 553 feet from its eastern end; the view from either direction was somewhat obstructed by track curvature and adjacent buildings. Under the circumstances as developed in the investigation had No. 599 furnished flag protection it is apparent that the accident would have occurred nevertheless because at the speed it was being operated and with the brakes already applied in emergency Extra 1558 could not have been stopped to comply with a flagman's signals at any point between the coal tipple and the point of accident.

Conclusions

This accident was caused by failure properly to obey signal indications and failure to move under proper control within yard limits prepared to stop unless the track was seen or known to be clear.

Respectfully submitted,

W. J. PATTERSON,

Director.