Inv-2309

INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE

NEW YORK CENTRAL RAILROAD

AND

GRAND TRUNK WESTERN RAILROAD

SOUTH BEND, IND.

NOVEMBER 12, 1938.

INVESTIGATION NO. 2309

SUMMARY

Inv-2309

Railroads:	New York Central	: Grand Trunk Western
Date:	November 12, 1938	
Location:	South Bend, Ind.	
Kind of accident:	Side Collision	
Trains involved:	N.Y.C. passenger	: G.T.W. passenger
Train numbers:	Extra 5247	: Passenger Extra 6037
Engine numbers:	5247	: 6037
Consist:	12 cars	: 11 cars
Speed:	4-5 m.p.h.	: 8-10 m.p.h.
Operation:	Yard rules and special instructions	: Timetable, train orders : and automatic block- : signal system
	Crossing protected by pole target, gate and color-light signal.	
Track:	Single: 5°58'27" curve to left	: Double; tangent; : slightly ascending grade : for eastbound trains
Weather:	Clear	
Time:	12:08 p.m.	
Casualties:	185 injured	
Cause:	Failure of G.T.W. Passenger Extra 6037 to be operated under control prepared to stop at railway crossing at grade.	

December 28, 1938.

To the Commission:

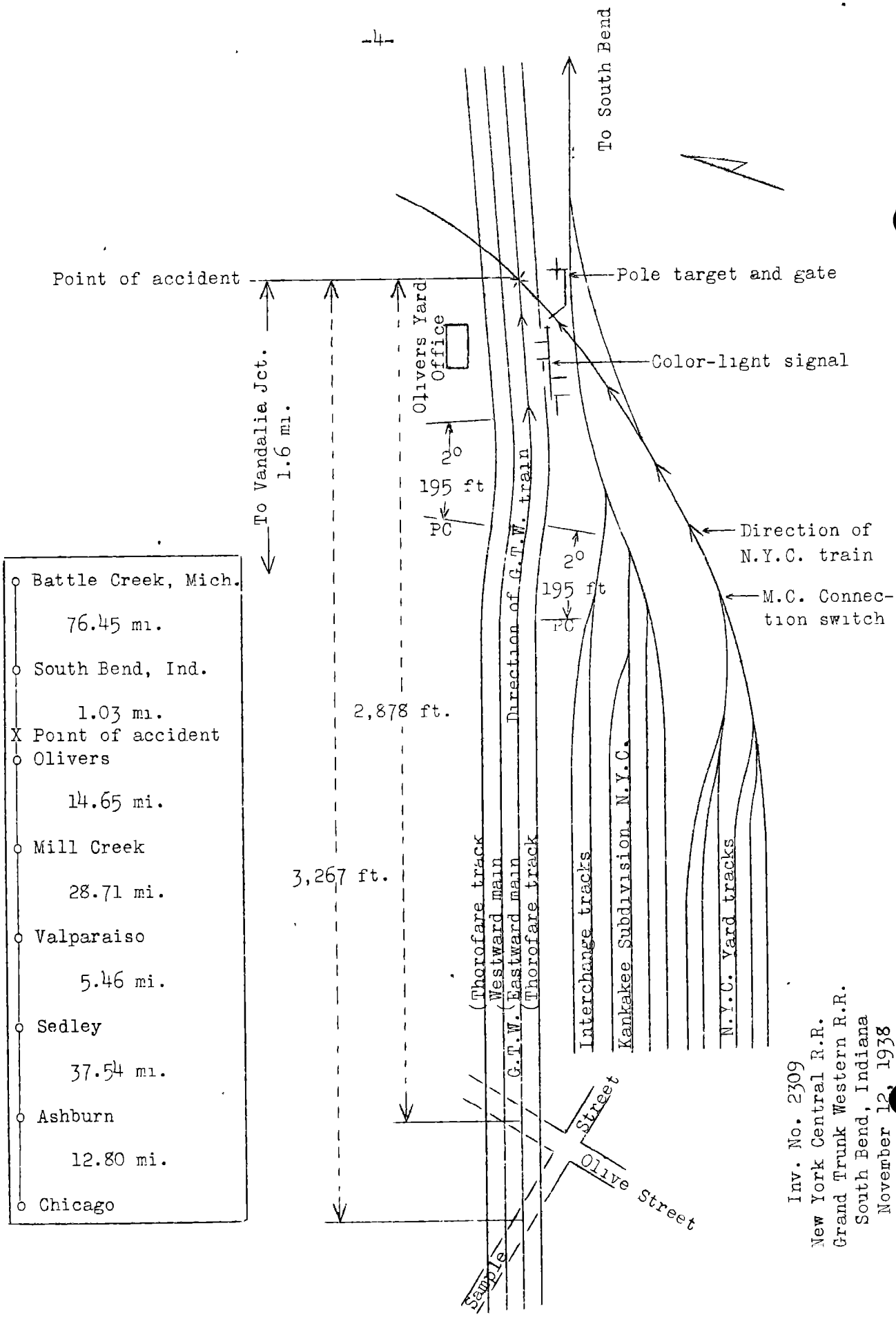
On November 12, 1938, there was a side collision between a passenger train of the New York Central Railroad and a passenger train of the Grand Trunk Western Railroad at South Bend, Ind., which resulted in the injury of 185 passengers. The investigation of this accident was made in conjunction with a representative of the Public Service Commission of Indiana.

Location and Method of Operation

The accident occurred at Olivers, at the intersection of the eastward main track of the Grand Trunk Western Railroad, hereinafter referred to as the G.T.W., and the New York Central-Michigan Central connection track, hereinfater referred to as the M.C. Connection. South Bend is located on that part of the Chicago Division of the G.T.W., designated as the South Bend Subdivision which extends between Chicago, Ill., and Battle Creek, Mich., a distance of 176.64 miles. In the vicinity of the point of accident it is a double-track line over which trains are operated by timetable, train orders, and an automatic block-signal system. Movements over the M.C.Connection are governed by yard rules and timetable instructions. Approaching the point of the accident from the west the G.T.W. track is tangent several miles, followed by a 2° curve to the right 195 feet in length, a 2° curve to the left 195 feet in length and tangent track 100 feet to the point of accident and some distance beyond. The grade for east-bound trains is slightly ascending at the point of accident.

The M.C. Connection extends from the N.Y.C. yard, which parallels the G.T.W. yard on the south, in a northerly direction on a 5°58'27" curve to the left and forms the west leg of a wye; it first crosses the N.Y.C. main track of the Kankakee Subdivision and then at an angle of 37°54'46" crosses four tracks of the G.T.W. in the following order: thorofare track or siding, eastward main, westward main, and thorofare track or siding. The grade is level. The M.C. Connection wye switch is 240 feet south of the first G.T.W. track encountered.

Movements over the crossings are protected by a pole target and gate located in the northeast angle of the crossing of the N.Y.C. main track of the Kankakee subdivision and the M.C. Connection, and a color-light signal located in the southwest angle of the crossing of the south thorofare track and the M.C.Connection. The signal is a 2-unit, color-light signal with marker lights, the upper unit being operative; it dis-



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plays indications in four directions, the aspects being green-over-red for proceed and red-over-red for stop. When a proceed indication for a movement on the M.C. Connection is displayed, a stop indication for the G.T.W. tracks is displayed, and when a proceed indication for a movement on the G.T.W. tracks is displayed, a stop indication for the M.C. Connection is displayed. The control circuits for these signals are carried through a double-pole knife-throw switch handled by an operator in the G.T.W. yard office located north of the G.T.W. tracks and west of the M.C. Connection. In addition, the circuits are carried through a circuit controller on the gate which protects movements over the crossing of the M.C. Connection and the N.Y.C. Kankakee line. When this gate is across the Kankakee line the operator can clear the signal for the M.C. Connection, and when it is across the M.C. Connection the operator can clear the signal for a G.T.W. movement. The normal position of the gate is across the M.C. Connection, with the target in vertical position for a movement on the Kankakee line. For a movement on the M.C. Connection the gate is placed across the Kankakee line and the target changes to a horizontal position. This target and gate do not govern movements on the G.T.W. tracks except that the change of the position of the gate and target from their normal positions automatically opens the circuit controller so that the G.T.W. cannot be given a proceed signal indication. Before making a movement over the M.C. Connection a member of a train crew must obtain permission from the operator, and the gate is usually handled by a member of the crew. The day of the accident, however, a yard conductor was assigned to handle the gate to facilitate the movement of football trains using the M.C.Connection en route to Notre Dame.

The color-light signal at the crossing has no approach signal indication and is not connected with the automatic-block signals on the G.T.W. In clear weather when the sun is shining brightly this color-light signal can be seen from an engine of an east-bound G.T.W. train a distance of approximately one-half mile.

Rule 98 of the G.T.W. operating rules reads in part as follows:

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> Trains must stop at non-interlocked railway crossings at grade and non-interlocked draw-bridges; they may then proceed when the proper signal is given.

Special instructions in the G.T.W. timetable provide.

> Olivers.- N.Y.C. Crossing; not interlocked; no derails, governed by color-light signals located just south of G.T.R. tracks near diamond crossing.

Extracts from city and village ordinances as to speed of trains, appearing in the G.T.W. timetable, provide as follows:

> South Bend. - Within the city limits eight miles per hour except where there is grade separation.***

The distance from the west city limits of South Bend to the point of accident is 10,082 feet.

West of South Bend there is no maximum speed restriction for G.T.W. passenger trains.

The weather was clear at the time of the accident, which occurred about 12:08 p.m.

Description

Extra 5247, an east-bound N.Y.C. passenger train, consisted of one baggage car, four coaches, one baggage car, three coaches, one baggage car, and two coaches, in the order named, all of all-steel construction, hauled by engine 5247, and was in charge of Conductor Moore and Engineman Creighton. This train left Chicago, 85.47 miles west of South Bend, at 10:12 a. m., according to the train sheet, and arrived at the passenger station at South Bend at 11:55 a.m. The train then backed to Olivers, a distance of 1.03 miles, and stopped west of the M.C. Connection wye switch. After receiving proceed signals, it started over the M.C. Connection and while moving over the G.T.W. tracks at a speed of 4 or 5 miles per hour was struck at the rear of the first car and the front of the second car by G.T.W. Passenger Extra 6037.

Passenger Extra 6037, an east-bound G.T.W. passenger train, consisted of one baggage car, three coaches, one dining car, two parlor cars, and four Pullman sleeping cars, in the order named, of all-steel construction, except the ninth car which had wood interior finish, hauled by engine 6037, and was in charge of Conductor Brown and Engineman Schillinger. This train left Chicago, 99.16 miles west of Olivers, at 10:11 a.m., according to the train sheet, passed Mill Creek, 14.65 miles west of Olivers, at 11:57 a.m., and collided with the N.Y.C. train while traveling at a speed estimated to have been between 8 and 10 miles per hour.

The first car of the N.Y.C. train stopped on its right side with its front end on the M.C. Connection and the rear end about 50 feet eastward on the G.T.W. tracks. The second car stopped to the right of the G.T.W. eastward track, leaning at an angle of about 45 degrees, its front end having been shoved eastward about 40 feet. Both cars were considerably damaged. The G.T.W. train stopped with the tender across the M.C. Connection, none of the equipment being derailed.

Summary of Evidence

Road Foreman of Engines Hackman, Yardmaster Entzian and Yard Conductor Fisk, of the N.Y.C., were stationed at Olivers to facilitate the movement of football trains over the M.C. Connection to Notre Dame, Road Foreman of Engines Hackman being at the M.C. Connection switch, Yardmaster Entzian, at the telephone located opposite the G.T.W. yard office and just west of the color-light signal, and Yard Conductor Fisk at the gate. After the N.Y.C. train stopped in the yard with the engine just west of the M.C.Connection switch, Yardmaster Entzian went to the operator's office and asked for permission for that train to move over the M.C.Connection. The operator gave him the usual hand signal and threw the switch that after the gate is thrown, clears the signal for a movement on the M.C. Connection. The yardmaster then relayed this signal to Yard Conductor Fisk who swung the gate to clear the M.C. Connection and signaled the engineman of the N.Y.C. train to proceed. Both Yardmaster Entzian and Yard Conductor Fisk saw that the color-light signal governing the G.T.W. eastward track displayed a red-over-red aspect, and a green-over-red aspect for a movement on the M.C.Connection. Road Foreman of Engines Hackman stood near the engine of the N.Y.C. train when it stopped just west of the M.C.Connection switch; he relayed the proceed signal to the engineman and instructed him to proceed slowly and look out for a train that had just proceeded over the crossing. He thought that the N.Y.C. train stood there about 1 or 2 minutes as the engineman had to take slack, and about 6 minutes elapsed from the time he received the proceed signal from the yard conductor to the time of the accident. He did not see the G.T.W. train at any time, as he was on the east side of the N.Y.C. train. Yard Conductor Fisk did not see the G.T.W. train at any time as he was located on the east side of the M.C. Connection. Due to performing other duties Yardmaster Entzian did not see the G.T.W. train until it was about 1½ car lengths from the crossing, at which time the N.Y.C. train was moving over the crossing, the engine having cleared it. Yardmaster Entzian stated that the M.C. Connection is used almost entirely by yard movements except during the football season when passenger trains are routed over it to Notre Dame.

Engineman Creighton, of the N.Y.C. train, stated that after backing to Olivers he stopped with the engine a few feet west of the M.C.Connection switch. After standing there about 30 seconds he received a proceed signal, took slack and started. He saw the pole target, but on account of the curve he was unable to see the color-light signal. The road foreman of engines, who was on the engine, and the fireman called its indication as clear. He was operating the train at a speed of about 4 or 5 miles per hour when he felt a jerk as though the air brakes had been applied in emergency.

The statements of Fireman Schaffer of the N.Y.C. train, and Road Foreman of Engines Harris corroborated those of the engineman. They added that as the movement was started they both looked toward the west but did not see any train approaching.

Conductor Moore, of the N.Y.C. train, stated that he was on the rear platform of the eighth car as the train started on the M.C.Connection and he saw the G.T.W. train approaching at a distance which he thought was 500 or 600 feet west of the crossing, and he estimated the speed of that train to have been about 20 miles per hour. The statements of Head Brakeman Babcock and Flagman Gibson brought out nothing additional of importance.

Engineman Schillinger, of the G.T.W. train, stated that a terminal test of the air brakes was made before leaving Chicago; he drew off between 15 and 20 pounds brake pipe pressure in two reductions and a test showed that there was practically no leakage; a running test was made shortly after leaving that point, almost bringing the train to a stop. The speed was reduced at five different points and four stops were made en route. The last stop was made at Ashburn, 12.8 miles east of Chicago, and the last reduction in speed was made at Valparaiso, 43.36 miles west of Olivers, at which time the speed was reduced to 20 or 25 miles per hour. He noticed nothing unusual in the operation of the brakes. After leaving Valparaiso all signal indications were clear. Approaching Vandalia Jct., 8,488 feet west of the point of accident, Road Foreman of Engines Billington, who had been sitting behind the fireman, came over to the right side of the cab and closed the throttle as the train reached the crossing at that point. The Engineman had his hand on the automatic brake valve at that time and a moment later he made a brake-pipe reduction; as the brake pipe exhaust seemed to be short he made another reduction and by that time they were approaching Sample and Olive Streets, located 3,267 and 2,878 feet, respectively, west of the point of accident. He could see as far as Olivers yard office and the track was clear. Realizing that the brakes were not responding, he opened the sanders and placed the brake valve in emergency position. As soon as he passed Olive Street he saw an engine proceeding over the crossing at the yard office and he also saw the red aspect of the color-light signal at the crossing; he sounded one long blast on the whistle. The speed of his train was being reduced and he thought he had ample time to stop, but when about 300 feet from the crossing he realized that the train was not going to stop and he jumped from the right side about 4 car lengths from the point of accident. Engineman Schillinger stated that he had been promoted to engineman in 1916, had qualified to operate passenger trains but had acted as fireman on the division on which the accident occurred during the recent

summer months, and had been running as an extra engineman out of Chicago during the last two months.

The statements of Fireman Donner, of the G.T.W. train, corroborated those of the engineman as to the brake tests and the reductions and stops made en route. The maximum speed attained was 75 miles per hour and a speed of between 70 and 75 miles per hour was maintained between Valparaiso and Vandalia Jct. Approaching Vandalia Jct. the steam was shut off, a brake application was made and the speed was reduced to 50 or 55 miles per hour. He thought the next reduction was made at the coal dock about 575 feet beyond; the speed was decreasing and he thought the train would stop for the crossing. When about halfway between the coal dock and the crossing, or 3,900 feet from the crossing, he realized that the train was not going to stop short of the crossing, and at this time he saw the road foreman of engines standing beside the engineman. After he saw the N.Y.C. train moving upon the crossing the engineman placed the brake valve in emergency position. Fireman Donner jumped from the right side of the engine just before the collision occurred; the tender and one car ran by him. Several times en route he had looked at the air gauge and noted that the brake pipe pressure was 90 pounds and main reservoir pressure 110 pounds.

Road Foreman of Engines Billington stated that he was on the engine at Chicago when the terminal air-brake test was made, and he noted that the brakes functioned properly when the running test was made as well as when the various reductions and stops were made en route. He was sitting on the drop seat behind the fireman until they approached Vandalia Jct., where he crossed over and stood on the deck beside the engineman. When between three-fourths and one-half mile west of the crossing at Vandalia Jct., the speed being between 65 and 68 miles per hour, he closed the throttle and a few seconds later he told the engineman to apply the brakes, which was done. When the engineman made the first reduction the brake pipe exhaust did not sound as it should; it was not as long as it should have been and did not cut off as it should. He then told the engineman to make a further reduction, which was done and the same results were obtained. By that time the train was approaching Sample Street and he told the engineman to apply the brakes in emergency. When they were a short distance east of Olive Street he saw the N.Y.C. train on the M.C. crossing. He estimated the speed of his train to have been between 20 and 30 miles per hour when passing Olive Street and 8 to 10 miles per hour at the time of the accident. The maximum speed en route was 80 miles per hour. Before the collision occurred he jumped off the engine and when the train stopped he was near the rear end of the first car. He immediately went to the engine and talked with the engineman

and the fireman who were near the engine cab on the left side. A few minutes later he talked with Conductor Brown and told him that the accident was due to lack of braking power. He and Conductor Brown then started back along the train to inspect it, the conductor preceding him. Reaching the head end of the third car the conductor stopped and pointed to an angle cock which was partly closed. The safety chains were coupled up, and had ample slack. He was unable to say how the angle cock had become partly closed.

Conductor Brown, of the G.T.W. train, stated that when the air-brake test was made at Chicago he was near the rear end of the third car. The brakes applied and released on that car, and he received a report from the car inspectors to the effect that the brakes operated properly on all cars. Approaching Vandalia Jct. he estimated the speed to have been about 75 miles per hour when he felt an air-brake application, and there was a second application at Sample Street. He was in the second car and went to the platform of the first car to look ahead at the order board. He then saw the road foreman of engines rolling on the ground and the N.Y.C. train on the crossing. The train stopped with very little shock. He did not feel a run-in of slack when the applications were made. After the accident he and Road Foreman of Engines Billington looked over the train and found a partly closed angle cock on the head end of the third car and a draw bar nearly out on the rear end of the sixth car. Conductor Brown thought it might have been possible for the safety chains to kick the angle cock around, although he never knew of a case where that had occurred. The slack in the safety chains between the second and third cars did not appear to be greater than between any of the other cars.

Head Brakeman Espy, of the G.T.W. train, stated that he was in the first three cars at several different times en route and was in the second car when an application of the air brakes was made at Vandalia Jct.; at no time had he felt a run-in of slack. He did not know the number of brake pipe reductions made and did not notice an emergency application of brakes.

Flagman Derigo, of the G.T.W. train, stated that he was at the rear of the train when the terminal test was made at Chicago and the brakes on the rear car applied and released properly. He was in the rear car and felt the applications of the air brakes en route; he did not feel the slack run in at any time. The speed was about 65 miles per hour at Vandalia Jct. where an air-brake application was made and the speed was somewhat reduced. The next application was made at Olive Street, at which point the speed was 30 or 35 miles per hour. The train made a very smooth stop at the point of accident. He immediately went back to flag and did not know thether the brakes were released after the train stopped.

N.Y.C. Yard Foreman Norris stated that he was about 150 feet east of the N.Y.C. yard office, which is located 3,150 feet west of the M.C. crossing, when the G.T.W. train approached, working steam; it passed him at a speed of 45 or 50 miles per hour, but he was unable to say whether it was still working steam or whether the brakes were applied. He thought the speed was a trifle higher than usual.

N.Y.C. Yardmaster Smith was in the yard office when the G.T.W. train passed and N.Y.C. Yard Clerk Dombrowski was outside the yard office; they estimated the speed of that train to have been between 45 and 55 miles per hour. Yardmaster Smith stated that he heard it working steam when it was approaching, but the engine was not working steam when it passed the yard office.

Road Foreman of Engines Brown, of the N.Y.C., arrived at the scene of the accident about 30 minutes after its occurrence and going back along the G.T.W. train he met Conductor Brown and Road Foreman of Engines Billington at the head end of the third car. He observed that the angle cock which was partly closed was of the self-locking type, the lugs were all right and there was no lost motion. The brakes were not applied on any car behind the second car. Air-brake tests were then made and it was found that the brakes applied on the engine and the first two cars only. When the conductor's valve on the third car was opened the brakes applied; in an attempt to release the brakes from the engine they released only on the engine and first two cars. The air hose was then parted between the second and third cars, leaving the partly closed angle cock in the position in which it was found, and there was a very slight exhaust of air from the air hose. He was of the opinion that the partly pulled-out draw bar was caused by the rebound of the train when the brakes on the head end were applied in emergency with no brakes applied on the rear end.

N.Y.C. Assistant Supervisor of Air Brakes Steed arrived at the scene of accident about 10 minutes after its occurrence, and assisted in making the brake tests. It was his opinion that with an 11-car train traveling at a speed of 75 miles per hour and with the brakes operating on only the engine and first two cars, it would take approximately 17,200 feet in which to stop the train. With full braking power it would take from 4,300 to 4,500 feet in which to stop. With the angle cock partly closed, its opening being sufficient to take care of leakage, the train could have moved over the entire division, but when making stops the crew should have known there was something radically wrong. When the air brake test was made prior to departure from Chicago, if the angle cock had been in the partly closed position as reported discovered after the accident, it would not have been possible to have full brake pipe

pressure the entire length of the train within the time allowed for such tests. It was his opinion that the rear of the train, considering normal brake-pipe leakage, could not be charged with full brake-pipe pressure with the angle cock in the partly closed condition as reported found after the accident.

General Air Brake Inspector Drye, of the G.T.W., stated that he made an examination of the angle cock involved after it had been removed from the car. Connecting the partly closed angle cock to an air line charged to 90 pounds pressure the flow of air was very weak. He said that had this angle cock been in that partly closed position when the engine was coupled to the train at Chicago it would have taken considerable time to fully charge the brake pipe. With full brake pipe pressure out of Chicago and this angle cock turned in the position it was reported found, and assuming there was no leakage, the brake pipe could possibly be kept charged, but the engineman would have difficulty in slowing down the train. He thought the station stops made en route could not have been made without the crew noticing that something was wrong. Behind the partly closed angle cock there would be no application of the brakes that would be noticed at the beginning, due to the slow reduction of brake pipe pressure, but possibly the brakes on the third and fourth cars would apply after some length of time. He said it was evident that this angle cock was turned somewhere between Valparaiso and Olivers, but he could not see how it could have been turned if it were securely locked in its proper position, and he was unable to suggest any explanation as to how it may have become turned.

General Foreman Forster, of the mechanical department of the C.& W.I., stated that G.T W. coach 4853, the third car in the G.T.W. train, arrived at Dearborn Street Station, Chicago, on November 10, and there were no mechanical defects noted nor repairs made before its departure on the day of the accident.

Car Foreman Hedenschoug, of the C.& W.I., stated that he inspected the equipment of the G.T.W. train when it was brought to Dearborn Street Station but did not examine each angle cock to see that it was in proper position. He stood beside the train as it left Chicago and noted that all brakes were released.

Depot Inspector Flasch, of the C. & W.I., stated that he made the terminal air-brake test at Dearborn Street Station, and all brakes applied and released properly.

According to statements submitted by G.T.W. officials, G.T.W. coach 4853, the third car in the train, had been released from the shops at Port Huron, Mich., on October 6, 1938,

after having received general repairs. Among other repairs, the LN brake equipment was converted to the U.C.B.D. type, with reservoir drain cock arrangement installed on face of pipe bracket. There were 52 feet of 1¼" brake-pipe renewed, 3 new cut-out cocks, 1 dirt collector, 2 brake pipe air hose, 2 air signal hose, 12 new brake shoes were applied, and both angle cocks were removed, tested and re-applied. Engine 6037 was equipped with ET brake equipment, and the cars were equipped as follows in the following order: 1 PM, 2 UCBD, 4 LN, 1 UC, 1 LN, 1 PM, and 1 UCB.

Observations of Commission's Inspectors

Observations were made by the Commission's inspectors in the following tests of the angle cock involved with the angle-cock in the position as reported found after the accident; these tests were conducted under the supervision of General Air Brake Inspector Drye of the G.T.W., at Battle Creek, Mich., on November 19 and 22:

First test

With the hose end of the angle cock connected to the air line carrying 90 pounds pressure and the other end open the air could be distinctly heard passing from the angle cock.

Second test

To determine the length of time required to charge a reservoir to 90 pounds pressure through the partly closed angle cock and with the gauge on the supply line showing a pressure of 94 pounds it was found that 6½ minutes were required to raise reservoir pressure to 10 pounds, 13 minutes for 20 pounds, 18 minutes for 30 pounds, and 1 hour 5 minutes for 90 pounds.

Third test

To determine the rate of decrease of the air pressure to the rear of the second car, a test was made consisting of a 15-pound brake pipe reduction from 90 pounds, with a locomotive brake valve which was then placed in lap position. At the end of five minutes the brake-pipe pressure was 87½ pounds. Brake pipe pressure was again increased to 90 pounds, and a reduction of 20 pounds was made and at the end of 5 minutes the brake pipe pressure was 84 pounds; then, without recharging, an additional 10-pound reduction was made and at the end of 5 minutes brake pipe pressure had been reduced to 80 pounds. An emergency reduction was then made and at the end of 1 minute brake pipe pressure had been reduced to 77 pounds.

After the above tests were completed the angle cock was tested by turning the handle to determine its rigidity; it was

found that the handle was extremely hard to turn, much more so than the average angle-cock handle.

Examination of the safety chains between the second and third cars of G.T.W. train did not indicate any probability that their movement could or would close the angle cock.

Discussion

The investigation disclosed that the N.Y.C. train had stopped for the crossing, and at the time of the accident was proceeding over the crossing under proceed signals; also, that a stop signal indication was displayed by the color-light signal at the crossing for the G.T.W. train, but notwithstanding that signal indication as well as the requirement of the rules that trains must stop at non-interlocked railway crossings at grade, the G.T.W. train was not stopped before proceeding upon the crossing.

Engineman Schillinger and Road Foreman of Engines Billington testified that the brake equipment on the G.T.W. train did not function properly when approaching the crossing where the accident occurred, and they attributed the failure to stop to lack of braking power. According to their statements, the speed of their train was 65 or 70 miles per hour when approaching Vandalia Jct., 1.6 miles west of Olivers; the road foreman of engines who was standing beside the engineman, closed the throttle and instructed the engineman to apply the brakes; the first reduction was made near Vandalia Jct., but as the exhaust seemed short a second reduction was made, followed shortly afterwards by an emergency application, but the brakes did not respond properly and the speed was reduced to only 8 or 10 miles per hour at the time the collision occurred. After the accident the conductor and the road foreman of engines started back to inspect their train and reported that they found a partly closed angle cock at the head end of the third car, to which they attributed the lack of braking power.

A N.Y.C. road foreman of engines arrived at the scene of the accident about 30 minutes after its occurrence and saw the partly closed angle cock and noted that the air brakes were released behind the second car.

In many respects the statements of the engineman and the road foreman of engines of the G.T.W. train are contradicted by other evidence. The investigation established the fact that the brake equipment on the G.T.W. train was in proper operating condition before this train left Chicago, and functioned properly at nine points en route where speed was reduced or the train stopped. The conclusion of the road foreman of engines and the engineman that the brake applications made just prior to the accident were not effective back of the second car is

directly contrary to evidence furnished by the flagman who testified that he was in the rear car and that he felt the brakes being applied both at Vandalia Jct., and at Olive Street, as well as by the statements of the flagman, the head brakeman who was in the second car, and the conductor who went from the second to the first car, that there was no run-in of slack and the train stopped with very little shock. Tests made after the accident were convincing that these results could not have been accomplished had the angle cock prior to the accident been in the partly closed position in which it was reported to have been discovered after the accident. The angle cock was of the self-locking type, and the handle was extremely hard to turn by hand, more so than the average angle cock, and examination of the safety chains did not indicate any probability that any movement by them could have closed the angle cock. A draw bar on the sixth car was partly pulled out, which would indicate that the brakes on the rear end were operating. It does not appear that this draw-bar could have been damaged by a run-in of slack, as the evidence indicated that no one felt any slack action.

The G.T.W. road foreman of engines said he closed the throttle when approaching Vandalia Jct., 1.6 miles west of Olivers; however, according to a N.Y.C. yardmaster and a N.Y.C. yard foreman the engine was working steam as it was approaching the N.Y.C. yard office located about 3,150 feet from the point of accident, from which it appears that the G.T.W. train may have been considerably closer to the crossing when steam was shut off than indicated by the G.T.W. road foreman of engines. Furthermore, the fact that the road foreman of engines closed the throttle himself instead of allowing the engineman who was operating the engine to do so suggests the probability that he may have been apprehensive concerning the speed of the train. The fireman said the emergency application of the brakes was made after he saw the N.Y.C. train on the crossing.

The record clearly shows that the G.T.W. train was being operated at high speed. The G.T.W. road foreman of engines estimated that the maximum speed attained was about 80 miles per hour. The train sheet shows that this train passed Mill Creek, 14.65 miles west of Olivers, at 11.57 a.m., and as the accident occurred at 12:08 p.m., the train made an average speed of 79.9 miles from Mill Creek to Olivers. Prior to the brake applications when approaching the crossing where the accident occurred the estimates of speed were 70 to 75 miles per hour by the fireman, 65 to 68 miles per hour by the G.T.W. road foreman of engines, 75 miles per hour by the conductor, and 65 miles per hour by the flagman; at Oliver Street the estimates varied from 20 to 30 miles per hour by the G.T.W. road foreman

of engines, 30 or 35 miles per hour by the G.T W. flagman, and from 45 to 55 miles per hour by three N.Y.C. employees who were on duty near that point. It is apparent that the city ordinance of South Bend which restricts the speed of trains to 8 miles per hour over street crossings at grade was not complied with.

Approaching Olivers on the G.T.W., the view was clear for several miles and the red aspect of the color-light signal and the N.Y.C. train on the M.C. Connection were seen by the members of the engine crew of the G.T.W. train after passing Olive Street. It is clearly established as a result of this investigation that the G.T.W. train was being operated at such a high rate of speed that when the stop signal and the train at the crossing were seen it was impossible to stop in time to avert the accident.

Conclusion

This accident was caused by the failure of G.T.W. Passenger Extra 6037 to be operated under control prepared to stop at a railway crossing at grade.

Respectfully submitted,

W. J. PATTERSON

Director.