Inv-2412

INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE

PENNSYLVANIA RAILROAD

WOODSTOCK, OHIO

JANUARY 31, 1940

INVESTIGATION NO. 2412

SUMMARY

Inv-2412

Railroad:	Pennsylvania
Date:	January 31, 1940
Location:	Woodstock, Ohio
Kind of accident:	Collision between two portions of a train
Train involved:	Shop
Train number:	Extra 3654 East
Engine number:	3654
Consist:	3 dead engines, 11 cars, and caboose
Speed:	10-15 m.p.h.
Operation:	Timetable, train orders, and automatic block and cab-signal system
Track:	Double; tangent; 0.06 to 0.655 percent descending grade eastward
Weather:	Foggy
Time:	12:55 a.m.
Casualties:	2 killed, 1 injured
Cause:	Rear portion of train which had broken in two overtaking forward portion on a descending grade, on account of brakes being inoperative on cars in rear portion of train

To the Commission:

On January 31, 1940, there was a collision between two portions of a shop train on the Pennsylvania Railroad near Woodstock, Ohio, which resulted in the death of two employees and the injury of one employee. This accident was investigated in conjunction with a representative of the Public Utilities Commission of Ohio.

Location and Method of Operation

This accident occurred on that part of the Columbus Division which extends between Hawthorne Jct., Ind., and Columbus, Ohio, a distance of 180.7 miles. In the vicinity of the point of accident this is a double-track line over which trains are operated by timetable, train orders, and an automatic block and cab-signal system. The accident occurred on the eastward main track at a point 6,790 feet east of Woodstock. Approaching from the west there are, successively, a $0^{\circ}28'$ curve to the left 868 feet long, a tangent 14,400 feet long, a $0^{\circ}08'$ curve to the right 575 feet long, and a tangent 5,157 feet to the point of accident and some distance beyond. Proceeding eastward from the water column at Brush Lake, 2.6 miles west of Woodstock, there are, successively, a 0.61 percent descending grade a distance of 470 feet, a 0.18 percent descending grade a distance of 2,680 feet, a vertical curve 1,000 feet in length, a 0.655 percent descending grade a distance of 12,180 feet, a vertical curve 5,300 feet to the point of accident and 350 feet beyond, and then a 0.06 percent descending grade a distance of 1,200 feet.

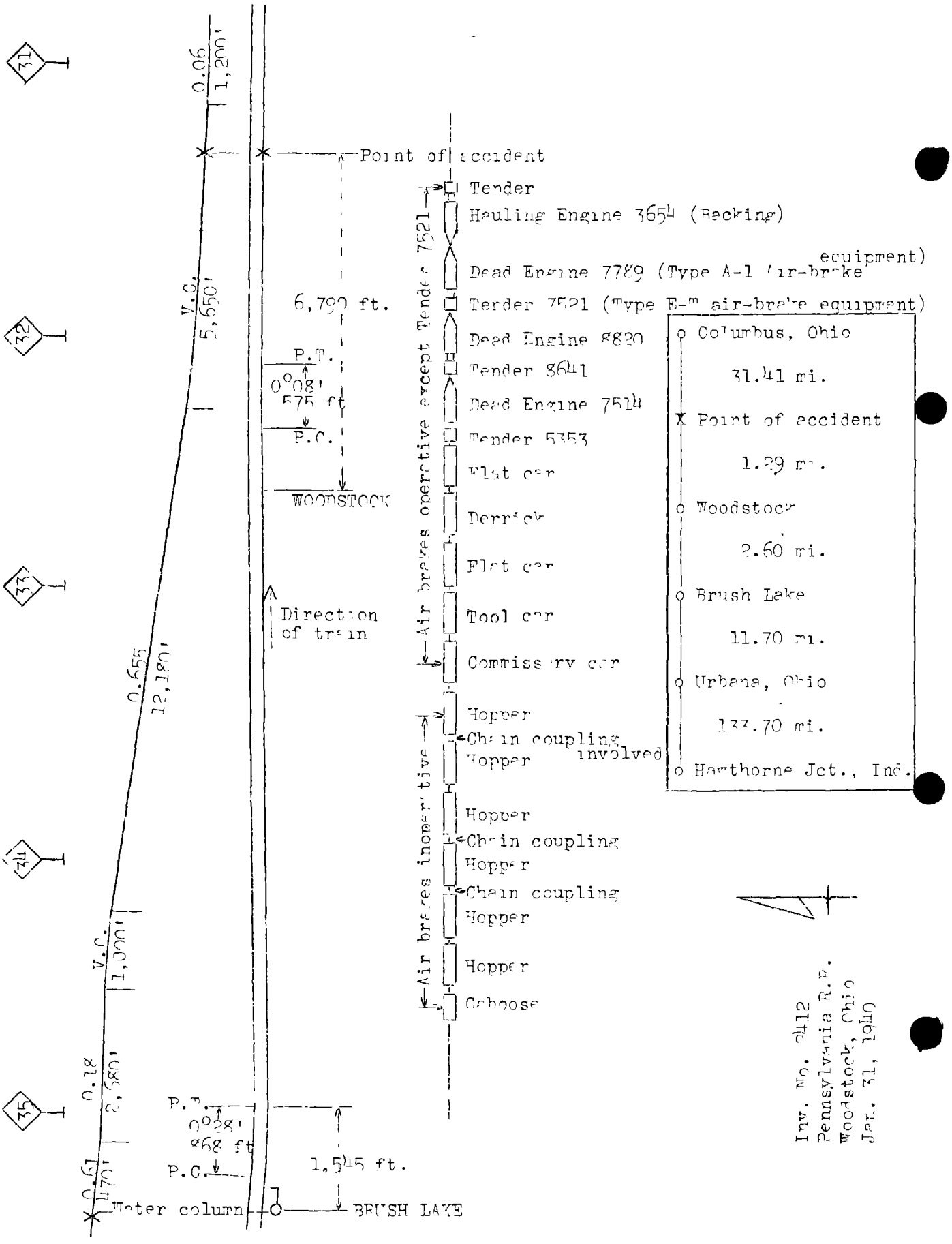
Rule D2001 of the Special Instructions in the timetable reads in part as follows:

* * *

> When it is necessary to move an engine in a train or light with any main or side rods disconnected, from one point to another, conductor or enginemen must secure instructions from the Superintendent as to the maximum speed permitted before the engine is dispatched.

* * *

Rule 4 of the Brake and Train Air Signal Instructions 99-B-1 reads in part as follows:



Inv. No. 2412
Pennsylvania R.R.
Woodstock, Ohio
Jan. 31, 1940

> Trains - Percentage of Air Brakes - All trains must have the air brakes of all cars in the train coupled up and operative leaving terminal points. Under no circumstances must a train be operated with less than 85 per cent of the brakes, without specific instructions from the Division Superintendent, who may specify the manner in which the train brakes shall be operated.
>
> * * *

The maximum authorized speed for the train involved was 15 miles per hour.

The weather was foggy at the time of the accident, which occurred about 12:55 a.m.

Description

On the morning of January 29, 6 hopper cars loaded with coal were damaged at Urbana, 47 miles west of Columbus, when the train in which they were being hauled made an emergency stop. These cars were set out at that point and a shop train was dispatched from Columbus at 6 a.m., January 30, to bring these hopper cars, together with 3 dead engines which had been set out at Urbana because of running hot, to Columbus for general repairs. After the dead engines and bad-order cars were assembled, a relief crew was placed in charge of the shop train for the return movement to Columbus.

Extra 3654 East, the east-bound shop train, with Conductor Burd and Engineman Bevington in charge, consisted of engine 3654 headed west, three dead engines headed east, one flat car, one derrick, one flat car, one tool car, one commissary car, six hopper cars loaded with company coal, and a caboose, in the order named. The crew held a message reading as follows:

> Bring dead engines 7789, 7514, and 8820 from Urbana to Columbus. Do not exceed a speed of 15 M.P.H. with them and watch for hot boxes especially the 7789.

This train left Urbana at 11:03 p.m., January 30, according to the train sheet. When this train departed from Urbana there were chain couplings between the first and second hopper cars, between the third and fourth hopper cars, and between the fourth and fifth hopper cars. The air brakes on the tender of the first dead engine, the six hopper cars, and the caboose were inoperative. Extra 3654 stopped at Brush Lake, 11.7 miles east of Urbana, for water and, when starting, the chain coupling

between the first and second hopper cars became disconnected; it was reapplied and the train left Brush Lake at 12:35 a.m., according to the evidence, and about 800 feet beyond this chain coupling again became disconnected and the train parted. The front portion of the train was moving about 10 or 15 miles per hour when, at a point 1.29 miles east of Woodstock, the rear portion, consisting of five hopper cars and the caboose, overtook and collided with the front portion. The brake-pipe on the front portion was broken and this resulted in the air brakes becoming applied in emergency; the train stopped about 884 feet beyond the point of collision.

The east truck of the first hopper car was derailed. The west end of the tool car telescoped the east end of the commissary car almost half its length. The west end of the commissary car telescoped the east end of the first hopper car a short distance. The east end of the second hopper car telescoped the west end of the first hopper car a short distance. There was but slight damage at other places in the train.

The employees killed were the wreck master and a laborer, and the employee injured was a carman helper, all of whom were in the commissary car.

Summary of Evidence

Engineman Bevington stated that the air brakes were tested at Urbana. The conductor informed him that the air brakes of the six hopper cars and the caboose were inoperative, but the train dispatcher had instructed him orally that the train should be moved in that condition. The engineman said that his engine was moving backward and hauling the train when it departed from Urbana; his cab window was open en route. He had received a message instructing him to proceed at not exceeding 15 miles per hour and to watch out for hot boxes. At Urbana when the train started to move a chain coupling separated between two of the bad-order cars. After these cars were rechained the train proceeded. At Brush Lake a stop was made to take water. He was not informed that trouble again was experienced with the chain coupling at this point but he saw someone go between two hopper cars. Between Brush Lake and the point of accident he looked back over his train at least six times; all these observations except the last were made between the water column and the east end of the first curve east of Brush Lake, a distance of 1,545 feet, and the last observation was made about 1/2 mile west of the point of accident; in each instance the caboose marker appeared to be about the normal distance from the engine. Although it was frosty and trailing smoke drifted down to the rear, he experienced no particular difficulty in seeing the marker. He closed the throttle at the beginning of the 0.655 percent descending grade when the speed

was about 5 or 6 miles per hour and permitted the train to drift. He used neither the automatic nor the independent brake valve at any time and a speed of 10 or 12 miles per hour was the highest speed attained. His first knowledge of anything being wrong was when the impact occurred, followed by a severe run-in, after which the air brakes became applied in emergency and the train stopped. Prior to the accident he observed that the brake-pipe pressure was 70 pounds.

Fireman May stated that he was unable to maintain a lookout because the coal in the tender was frozen and it was necessary to dig it down during the intervals he was not tending the fire. When about 1 mile east of Brush Lake he looked back toward the caboose and, although there was frost in the air, he was able to see the caboose marker; the train appeared to be intact. A speed of 12 to 15 miles per hour was attained just prior to the accident. He felt no unusual slack action en route and his first knowledge of anything being wrong was when he felt an impact which was followed by a run-in of slack.

Front Brakeman Finke stated that he was on the engine and maintained a lookout to the rear while the train was moving. He saw the caboose marker several times while on curved track; the caboose appeared to be at normal distance from the engine.

Conductor Burd stated that at Urbana after the train was assembled an air-brake test was made and it was found that the percentage of operative brakes was below the prescribed minimum. He reported this fact to the train dispatcher and was orally instructed to haul the train in that condition. He also had a message instructing his crew that the train should be moved at a speed not exceeding 15 miles per hour. The air hose between the commissary car and the car to the rear were not connected. The hand brake on the car next ahead of the caboose was inoperative. When starting the train at Urbana a chain coupling separated between the first and second hopper cars and the rear portion of the train ran about 20 car lengths before it was stopped by means of hand brakes. From Urbana to Brush Lake the trip was without unusual incident. When the train was ready to depart from Brush Lake the chain coupling between the first and second hopper cars again was discovered to be separated; in this instance the separation was caused by the chain becoming unhooked. After rechaining these cars the train departed from Brush Lake. He said that he was on the ground when the train started; he inspected the train as it passed by and he did not observe any jerk or slack action. After boarding the train he was occupied with clerical duties in the lower part of the caboose. When about 2.5 miles east of Brush Lake he went out on the rear platform and observed the sides of the train. At that time the engine appeared to be the normal distance from

the caboose and he thought the train was intact. The maximum speed attained prior to the accident was about 10 or 12 miles per hour. He felt no slack action prior to the accident. The first knowledge he had of anything being wrong was when an impact occurred, such as would be caused by the rear portion of the train colliding with the front portion. The accident occurred at 12:55 a.m. He said that the wreck-master had supervised the placing of the chain couplings and the train was operated under the wreck-master's orders.

Flagman Williams corroborated the conductor's statement in substance. He said the conductor had warned him that the train might part; consequently he maintained a close lookout ahead while the train was moving. After leaving Brush Lake he went to the rear platform several times to watch along the side and in each instance the engine seemed to be at normal distance from the caboose. Just prior to the accident the slack ran in at least three times; in one instance it was sufficient to move the lanterns which were on the floor of the caboose.

Car Repairman Wright, who was a member of the shop crew accompanying the train involved, stated that the coupler at the west end of the first hopper car was missing and, at Urbana, one end of a chain was fastened around the center-sill and the other end around the shank of the coupler at the east end of the second car. The chain was pulled tight but was not crossed and, when the train started, it slipped over the coupler, but it was not released. At Brush Lake this coupling chain was removed because of slack and it was reapplied by placing it again around the center-sill of the first hopper car and then bringing it around the coupler head of the second hopper and hooking it to form a "figure 8." Hooks at each end of the chain were turned so that the chain would pull against the hooks. After leaving Brush Lake he was in the tool car and felt no unusual surge or slack action. The speed was about 12 to 15 miles per hour and his first knowledge of anything being wrong was when the accident occurred. He said that the wreck-master supervised the placing of the chains. He had been assigned, over a period of about 17 years, to duty with the wreck train and during this time he knew of no instance wherein difficulty had been experienced with chain couplings.

Car Foreman Wilson stated that he arrived at the scene of accident about 3:30 a.m. He examined the equipment and found that at the west end of the tool car the coupler was missing and that the tool car had telescoped the front end of the commissary car about half its length. The sides and the roof of the commissary car were badly broken; the couplers were broken out at each end of this car. The west end of the commissary car telescoped the east end of the first hopper car. The coupler-yoke rivets of the east coupler of the first hopper car were sheared off; this coupler was found south of

the track and about 600 feet west of the point where the first hopper car stopped. The first hopper car slightly telescoped the east end of the second hopper car. The chain which was used to couple the first and second hopper cars together was found undamaged at a point about 4 miles west of the point of accident. He said that it was not standard practice to secure by wire the hooks of chains which were used for emergency couplings, but occasionally the hooks were wired. It was his opinion that the air brakes became applied in emergency as a result of the brake-pipe on the commissary car becoming broken in the accident. The hopper cars involved had been damaged prior to the time they were placed at the rear of the wreck train at Urbana and the air hose could not be coupled between them.

Trainmaster Streett stated that he issued instructions for the wreck train to move from Urbana to Columbus six damaged hopper cars loaded with company coal, and three dead engines consigned to the shop.

Division Engineer Greenough stated that he thought the accident was caused by failure of the chain coupling between the first and second hopper cars. Because the air brakes were inoperative on the rear portion of the train, after the separation it drifted slowly behind the front portion. When the rear portion reached the 0.655 percent descending grade the speed was increased, and it overtook the front portion and collided, the impact being sufficient to break the brake-pipe, and this resulted in the air brakes on the front portion of the train becoming applied in emergency. Damage to the commissary car was caused by this emergency application and the run-in of the rear hopper cars.

Train Dispatcher Reimar, on duty from 3 p.m. to 11 p.m., January 30, 1940, stated that the conductor of Extra 3654 informed him the number of operative brakes was less than 85 percent and asked for instructions. After conferring with the powerman he orally instructed the conductor to move the train from Urbana with the brakes in that condition.

Powerman Kramer stated that he was on duty from 3 p.m. to 11 p.m., January 30, 1940. When Dispatcher Reimar asked his advice concerning the number of operative brakes on Extra 3654, he gave his permission to move the train with less than 85 percent operative air brakes. He said that he understood it was permissible to move shop trains with less than the required amount of operative brakes. He understood that Extra 3654 had 66 or 68 percent operative brakes.

Division Superintendent Ridgely stated that the accident was a result of a separation which occurred between the first and second hopper cars; the chain used for a coupling was found at a point 800 feet east of the water column at Brush Lake. This

detached portion, which consisted of five hopper cars, loaded with coal, and the caboose, overtook the front portion at a point 3.9 miles east of Brush Lake, near the end of a 0.655 percent descending grade. The impact broke a brake-pipe on the front portion and this resulted in an emergency application of the brakes.

According to data furnished by the railroad, Extra 3654, when assembled at Urbana, was made up as follows:

UNIT	NUMBER		BRAKE	REMARKS
Tender	----	headed	No. 6-ET operative	
Engine	3654	west	No. 6-ET operative	
Engine	7789	headed	A-1 operative	Main rods off.
Tender	7521	east	No. 6-ET inoperative	
Engine	8820	headed	No. 6-ET operative	Main rods off.
Tender	8641	east	No. 6-ET operative	
Engine	7514	headed	No. 6-ET operative	Main and side
Tender	5353	east	No. 6-ET operative	rods off.
Flat	491305		operative	
Derrick	495774		operative	
Flat	491309		operative	
Tool	999909		operative	
Commissary	999557		operative	
Hopper	176892)	chained	inoperative	Company coal.
Hopper	747224)		inoperative	Company coal.
Hopper	745451)	chained	inoperative	Company coal.
Hopper	412126)	chained	inoperative	Company coal.
Hopper	185260)		inoperative	Company coal.
Hopper	744035		inoperative	Company coal.
Caboose	981803		inoperative	

Note: The brake on tender 7521 was inoperative when this tender was coupled to engine 7789 because of a difference in air-brake equipment. The brake pipes were defective on the six hopper cars because of damage sustained previously. Because of defective couplers chain couplings were applied between the first and second hopper cars, between the third and fourth hopper cars, and between the fourth and fifth hopper cars in order to haul these cars from Urbana to Columbus.

The records disclose that tool car 999909 was built in 1905 as a railway mail car and was converted to a tool car in 1923. Commissary car 999557 was built in 1906 as a railway mail car and was converted to a commissary car in 1923. Both cars were of wooden construction.

Observations of the Commission's Inspectors

The Commission's inspectors observed marks on the ties at a point about 800 feet west of the point where the commissary car stopped; these marks were identified as having been made by the coupler which was knocked out of the east end of the first hopper car. An examination of the commissary car subsequent to the accident disclosed that the sills were of wood and were in sound condition. The hand brake on the sixth hopper car was inoperative. It was observed that it would have been hazardous for an employee to pass over the tops of the hopper cars to apply hand brakes, because of the chain couplings between the hopper cars.

Discussion

According to the evidence, Extra 3654 was assembled at Urbana as a shop train. As this train started to leave this station a chain coupling between the first and second hopper cars separated. This coupling again separated at Brush Lake and, after being reapplied, again separated at a point about 800 feet east of the water column at Brush Lake, or about 4 miles from the point of accident, but no one on the train knew of this last separation until after the collision of the two portions. While en route the three members of the crew on the engine looked to the rear several times and the caboose appeared to be at normal distance from the engine; the conductor and the flagman also looked forward several times to inspect the train, and the engine appeared to be at normal distance from the caboose. After the train left Brush Lake no one except the flagman felt slack action. The engineman said that he did not use either the automatic or the independent brake-valve after the train left Brush Lake. After the accident occurred the chain that had been between the first and second hopper cars was found, unbroken, at a point 800 feet east of the water column at Brush Lake.

The evidence indicates that after the train started down the 0.61 percent grade just east of the water column at Brush Lake the engineman closed the throttle at a point where the grade changed to 0.18 percent descending. Apparently, when the front portion of the train was on the 0.18 percent descending grade and the rear portion was on the 0.61 percent descending grade, a retarding action caused by the drag of the engine resulted in slack action sufficient to permit the separation of the chain coupling. The detached rear portion of the train then drifted slowly until it reached the 0.655 percent descending grade, and during this time the front portion moved at a higher rate of speed; these conditions resulted in the two portions being a considerable distance apart. On the 0.655 percent descending grade, the speed of the rear portion increased

gradually until it became greater than that of the front portion, and when the front portion reached a point where the grade moderated to 0.06 percent descending, it was overtaken and struck by the rear portion. The evidence was to the effect that the two portions were moving at a speed from 10 to 15 miles per hour when the collision occurred; however, from the resultant damage it appears that just prior to the collision the rear portion had attained a considerably greater speed than that of the front portion.

There were 20 braking units in this train, but only 12 units, or 60 percent, were operative. All brakes of the rear portion were inoperative. If not less than 85 percent of the brakes of this train had been operative there would not have been more than 3 units with inoperative brakes. If not more than 3 units with inoperative brakes had been located among the 6 units of the detached rear portion, undoubtedly application of the brakes of the other 3 units would have been sufficient to stop the 6 units and the collision between the two portions would not have occurred.

Because of an inoperative hand brake on the rear hopper car and the hazard presented by the chain coupling between the fourth and fifth hopper cars, it appears that had the conductor or the flagman observed the last separation of the train the hand brake on the caboose was the only hand brake immediately available for use with safety.

Conclusion

This accident was caused by the rear portion of a shop train which had broken in two overtaking the forward portion on a descending grade, on account of the brakes being inoperative on the cars in the rear portion of the train.

Respectfully submitted,

S. N. MILLS,

Director.