

INTERSTATE COMMERCE COMMISSION
WASHINGTON

INVESTIGATION NO. 3272
BOSTON AND MAINE RAILROAD
REPORT IN RE ACCIDENT
AT CANAAN, N. H., ON
AUGUST 19, 1949

SUMMARY

Date: August 19, 1949

Railroad: Boston and Maine

Location: Canaan, N. H.

Kind of accident: Head-end collision

Trains involved: Passenger : Passenger

Train numbers: 332 : 307

Engine numbers: Diesel-electric : Diesel-electric
unit 3807 units 4225-A and
4225-B

Consists: 6 cars : 7 cars

Estimated speeds: Standing : 40 m. p. h.

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

Track: Single; tangent; 0.28 percent
descending grade northward

Weather: Clear

Time: 2:34 p. m.

Casualties: 235 injured

Cause: Switch being opened immediately in
front of approaching train

Recommendation: That the Boston and Maine Railroad
install electric switch-locking at
main-track hand-operated switches
in automatic block-signal territory

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 3272

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION REPORTS
UNDER THE ACCIDENT REPORTS ACT OF MAY 6, 1910.

BOSTON AND MAINE RAILROAD

October 6, 1949

Accident at Canaan, N. H., on August 19, 1949, caused by
a switch being opened immediately in front of an
approaching train.

REPORT OF THE COMMISSION¹

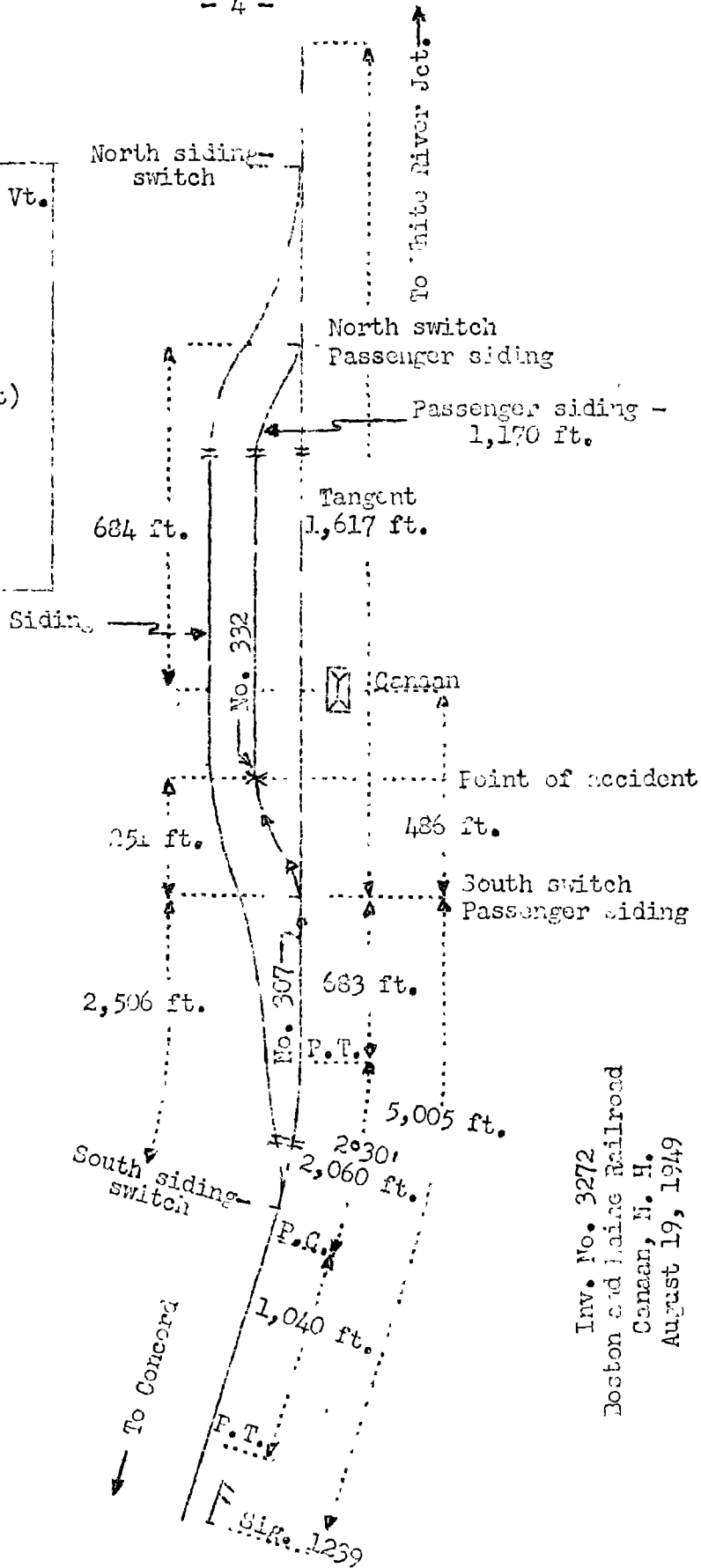
PATTERSON, Commissioner:

On August 19, 1949, there was a head-end collision between two passenger trains on the Boston and Maine Railroad at Canaan, N. H., which resulted in the injury of 221 passengers, 6 persons carried under contract, and 8 train-service employees. This accident was investigated in conjunction with representatives of the New Hampshire Public Service Commission.

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Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.

- White River Jct., Vt. | 4.62 mi.
- Lebanon, N. H. | 6.64 mi.
- Enfield | 6.80 mi.
- X Canaan | (Point of accident) | 3.01 mi.
- Grafton | 24.86 mi.
- Franklin | 18.67 mi.
- Concord, N. H.



Inv. No. 3272
 Boston and Maine Railroad
 Canaan, N. H.
 August 19, 1949

Location of Accident and Method of Operation

This accident occurred on that part of the New Hampshire Division extending between White River Jct., Vt., and Concord, N. H., 69.6 miles, a single-track line, over which trains are operated by timetable, train orders and an automatic block-signal system. At Canaan, 18.06 miles south of White River Jct., a siding 4,340 feet in length parallels the main track on the west. The south siding-switch is 2,992 feet south of the station. A siding 1,170 feet in length, designated as the passenger siding, lies between the main track and the other siding. The north and south switches of the passenger siding are, respectively, 684 feet north and 486 feet south of the station, which is located east of the main track. The accident occurred on the passenger siding at a point 251 feet north of the south switch. Entry to the passenger siding from the south is made through a No. 10 turnout having a maximum curvature of 7°05'. From the south on the main track there are, in succession, a tangent 1,040 feet in length, a 2°30' curve to the left 2,060 feet, and a tangent 683 feet to the south switch of the passenger siding and 1,617 feet northward. The grade for north-bound trains varies between 0.18 percent and 0.28 percent descending throughout a distance of 3,534 feet immediately south of the point of accident, and is 0.28 percent descending at that point.

The automatic block-signal system is arranged on the overlap principle. Signal 1239, governing north-bound movements, is located 5,005 feet south of the south passenger-siding-switch. This signal is of the two-arm, semaphore type, and displays three aspects in the lower quadrant. It is approach lighted. The involved aspect and the corresponding name and indication of this signal is as follows:

<u>Aspect</u>	<u>Indication</u>	<u>Name</u>
Diagonal over diagonal	Proceed	Clear

The switch stand at the south passenger-siding-switch is of the horizontal-throw, low-stand type, and is located 4 feet 2-1/2 inches west of the west rail. It is provided with a rectangular red target measuring 8 inches by 12 inches. The center of the target is 1 foot 8 inches above the level of the tops of the ties. When the switch is lined normally the target is parallel to the track. When the switch is lined for entry to the siding the target is displayed at right angles to the track.

This carrier's operating rules read in part as follows:

104. * * *

* * *

A train or engine must not foul a track until switches connected with the movement are properly lined, * * * and when waiting to cross from one track to another and during the approach or passage of a train * * * on tracks involved, all switches connected with the movement must be secured in the normal position. * * *

104c. * * *

Employes must not unlock or stand within twenty feet of main track switches while a train is approaching or passing.

210. * * *

* * * Conductors must show train orders when practicable to trainmen. * * * trainmen must insist on seeing, and are required to read, train orders * * * at first opportunity * * *.

Timetable special instructions read in part as follows:

88. TRACKS TO BE USED IN MEETING OR PASSING TRAINS AT DESIGNATED POINTS.

* * *

At Canaan, scheduled passenger trains taking siding to meet or pass another train will use "Passenger-Siding."

* * *

South-bound trains are superior to trains of the same class in the opposite direction.

In the vicinity of the point of accident the maximum authorized speed for passenger trains is 60 miles per hour.

Description of Accident

No. 332, a south-bound first-class passenger train, consisted of Diesel-electric unit 3807, one mail-baggage car, one passenger-baggage car, two coaches, one chair car, and one coach, in the order named. All cars were of all-steel construction. At White River Jct. the crew received copies of train order No. 23, reading as follows:

No. 332 meet No. 307 at Canaan.

This train departed from White River Jct. at 1:55 p. m., on time. At Lebanon, 13.44 miles north of Canaan, the crew received copies of train order No. 24, reading as follows:

No. 332 take siding at Canaan to meet No. 307.

No. 332 departed from Lebanon at 2:09 p. m., 2 minutes late, departed from Enfield, the last open office, 6.8 miles north of Canaan, at 2:22 p. m., 3 minutes late, entered the passenger siding at Canaan at the north switch, and stopped opposite the station at 2:32 p. m., with the front end 251 feet north of the south switch. About 2 minutes later it was struck by No. 307.

No. 307, a north-bound first-class passenger train, consisted of Diesel-electric units 4225-A and 4225-B, coupled in multiple-unit control, two milk cars, one mail-baggage car, one passenger-baggage car, one coach, one chair car, and one coach, in the order named. The second car was of steel-underframe construction, and the other cars were of all-steel construction. At Franklin, 32.87 miles south of Canaan, the crew received copies of train orders Nos. 23 and 24. This train departed from Franklin at 1:58 p. m., 13 minutes late, passed Grafton, the last open office, 8.01 miles south of Canaan, at 2:25 p. m., 9 minutes late, passed signal 1239, which indicated Clear, and while moving at a speed of about 40 miles per hour it entered the passenger siding at Canaan and struck No. 332.

No. 332 was moved northward approximately 85 feet by the impact. The front truck of the Diesel-electric unit was derailed, and the front end of the unit was badly damaged. The other units of the train were not derailed. The second car was somewhat damaged, and the rear end of the third car and the front end of the fourth car were badly damaged. The

frame of the first Diesel-electric unit of No. 307 was bent, and the unit was otherwise badly damaged. The second unit was somewhat damaged. The front truck of the first car was derailed, and the car stopped in line with the siding. The second car was derailed and stopped upright, with the front end on the siding and the rear end across the main track. The front truck of the third car was derailed. The second, third, and fifth cars were considerably damaged.

The conductor, the engineer, and the fireman of No. 332, and the conductor, the engineer, the fireman, the brakeman, and the flagman of No. 307 were injured.

The weather was clear at the time of the accident, which occurred at 2:34 p. m.

Discussion

The crews of Nos. 332 and 307 held copies of train order No. 23, which established Canaan as the meeting point between these trains, and train order No. 24, which provided that No. 332, the superior train by direction, take siding at the meeting point. Timetable special instructions provided that a scheduled passenger train taking siding at Canaan to meet another train must use the passenger siding. All the members of each crew so understood.

The baggageman of No. 332, who was required to operate the switches for No. 332 to enter and to leave the siding at Canaan, entered the control compartment of the Diesel-electric unit at Enfield, the last scheduled stop prior to the arrival at Canaan. The train was stopped at the north passenger-siding-switch at Canaan at 2:29 p. m. The baggageman lined the switch for the train to enter the siding, and then re-entered the control compartment of the Diesel-electric unit. The train entered the siding, and it stopped opposite the station, with the front of the Diesel-electric unit 251 feet north of the south passenger-siding-switch. At Canaan the crew received copies of train orders Nos. 23 and 24 addressed to the operator at that station. These orders were read by the engineer and the fireman but were not read by the baggageman. The engineer then released the automatic brakes of the train, but the independent brake was applied. When the train stopped, the baggageman alighted from the Diesel-electric unit and proceeded toward the south passenger-siding-switch. The enginemen remained in the control compartment of the Diesel-electric unit. The conductor alighted from the rear of the second car, and the brakeman alighted from the rear of the third car. The

flagman lined the north passenger-siding-switch to normal position and then walked to the rear of the train. About 2 minutes after the train stopped, and when the front end of No. 307 was about 75 feet south of the south passenger-siding-switch, the fireman observed the baggageman line the switch for entry to the siding. No. 307 entered the siding and the collision occurred a few seconds later. None of the members of the crew of No. 332 observed the baggageman as he proceeded toward the switch, and none of them except the fireman saw him operate the switch.

As No. 307 was approaching the point where the accident occurred the speed was about 55 miles per hour. The enginemen were maintaining a lookout ahead from the control compartment at the front of the first Diesel-electric unit, the conductor and the baggageman were in the baggage compartment of the passenger-baggage car, and the flagman was in the rear car. The brakes of this train had been tested and had functioned properly when used en route. The last automatic signal which this train passed indicated Clear. After the train passed this signal, the speed was reduced to about 40 miles per hour. When the Diesel-electric unit reached a point about 1,000 feet south of the south passenger-siding-switch, the enginemen observed that No. 332 was on the passenger siding. The baggageman was watching from the door of the baggage compartment, and when the train was closely approaching the south passenger-siding-switch he observed the baggageman of No. 332 run to the switch and line it for entry to the siding. The enginemen did not observe the baggageman run toward the switch, but, when the Diesel-electric unit was about 75 feet south of the switch, they observed him line it for entry to the siding. The engineer immediately placed the brake valve in emergency position and sounded a warning on the pneumatic horn. No. 307 entered the siding and collided with No. 332 before the speed of the train had been materially reduced.

The baggageman of No. 332 said that he had read the train order requiring No. 332 to take siding at Canaan, and that he fully understood it. He said that after he alighted from the Diesel-electric unit he became confused, and he was unable to account for his action in unlocking and operating the switch while No. 307 was closely approaching it.

If the south passenger-siding-switch at Canaan had been provided with electric switch-locking, it would not have been possible to operate the switch immediately in front of the approaching train.

Cause

It is found that this accident was caused by a switch being opened immediately in front of an approaching train.

Recommendation

It is recommended that the Boston and Maine Railroad install electric switch-locking at main-track hand-operated switches in automatic block-signal territory.

Dated at Washington, D. C., this sixth day of October, 1949.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,
Secretary.