Inv-2393

INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE

ILLINOIS CENTRAL RAILROAD

MATTOON, ILL.

NOVEMBER 19, 1939

INVESTIGATION NO. 2393

SUMMARY

Inv-2393

Railroad:	Illinois Central	
Date:	November 19, 1939	
Location:	Mattoon, Ill.	
Kind of accident:	Rear-end collision	
Trains involved:	Freight	: Passenger
Train numbers:	87	: 1
Engine numbers:	2504	: 2408
Consist:	137 cars and caboose	: 9 cars
Speed:	Standing	: 15-25 m. p. h.
Operation:	Timetable, train orders and cab-signal block and automatic train-stop system	
Track:	Double; tangent; 0.049 percent ascending grade southward	
Weather:	Misty, with fog pockets	
Time:	12:45 p. m.	
Casualties:	8 injured	
Cause:	Failure to provide proper flag protection for the preceding train and by operation of following train in automatic train-stop territory with automatic train-stop and cab-signal devices cut out, contrary to current instructions, resulting in an imperfectly displayed cab signal	

Inv-2393

March 7, 1940.

To the Commission:

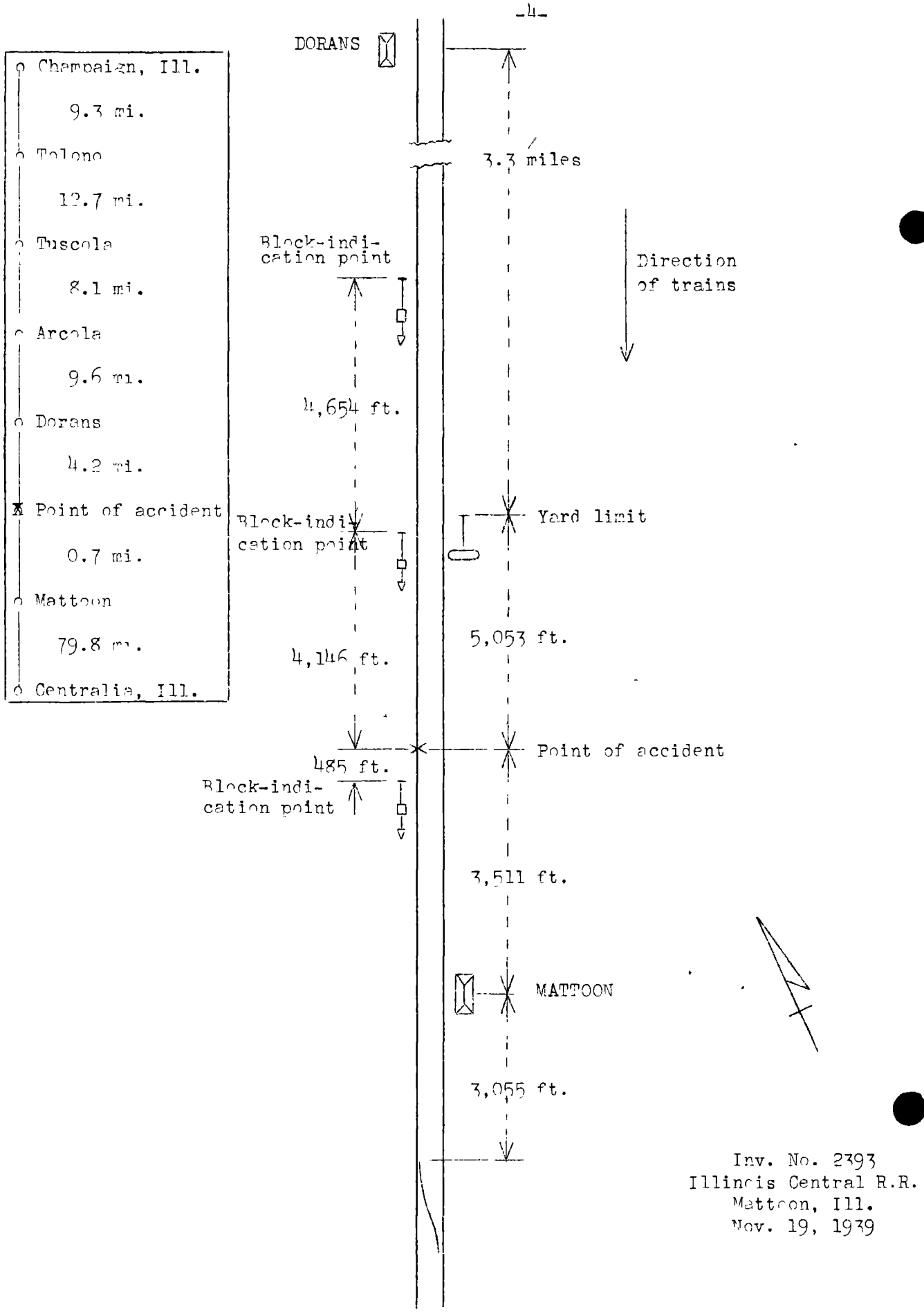
On November 19, 1939, there was a rear-end collision between a freight train and a passenger train on the Illinois Central Railroad at Mattoon, Ill., which resulted in the injury of two passengers, five dining-car employees, and one train-service employee.

Location and Method of Operation

This accident occurred on that part of the Illinois Division designated as the Champaign District which extends between Champaign and Centralia, Ill., a distance of 124.4 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 a cab-signal block and automatic train-stop system. This accident occurred on the southward track, within yard limits, at a point approximately 3,511 feet north of Mattoon station and 5,053 feet south of the north yard-limit board. Approaching this point from the north there is a tangent which extends a distance of more than 7 miles to the point of accident and approximately 3 miles beyond. The grade for south-bound trains is, successively, level a distance of 2,300 feet, 0.25 percent ascending 600 feet, level 1,400 feet, 0.417 percent descending 2,900 feet, 0.073 percent ascending 1,500 feet, 0.125 percent descending 400 feet, level 2,000 feet, 0.585 percent ascending 3,300 feet, and 0.049 percent ascending 900 feet to the point of accident and 3,600 feet beyond.

Facing-point cross-overs between the southward and northward main tracks are located approximately 3,055 feet and 3,672 feet south of the station at Mattoon

The automatic cab-signal and train-stop system is of the continuous inductive type; engines are equipped with 2-indication color-light cab signals which display either a green or a red aspect. There are no wayside signals except semi-automatic home signals located at interlockings. Cab signals are actuated at block-indication points, which correspond with the points at which wayside signals, if used, would be located. When the cab signal changes from a green to a red aspect a warning whistle in the cab of the engine sounds and if it is not acknowledged within 6 seconds by operation of the engineman's acknowledging lever an automatic brake application, sufficient to stop the train, will occur; this brake application cannot be released until a predetermined brake-pipe reduction has been made. If the brake application is forestalled by the engineman, the train may proceed under his control in accordance with the operating rules. When a train is operating under a red aspect in two



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consecutive blocks and passes the block-indication point between the two blocks the cab signal changes to green while the engine is moving over an energized section of the track 200 feet in advance of the block-indication point and then changes back to a red aspect which causes the cab warning-whistle to sound and the automatic train-stop device to operate if it is not forestalled by the engineman.

Block-indication points are located 8,800 feet and 4,146 feet north of the point of accident.

Transportation rules of the carrier read in whole or in part as follows:

> 27. A signal imperfectly displayed, or the absence of a signal at a place where a signal is usually shown, must be regarded as the most restrictive indication that can be given by that signal * * *.
> * * *
>
> 34. All members of train and engine crews must, when practicable, communicate to each other by its name the indication of all signals affecting the movement of their train.
>
> 86. Unless otherwise provided, an inferior train must clear the time of a superior train, in the same direction, not less than five minutes; but must be clear at the time a first-class train, in the same direction, is due to leave the next station in the rear where time is shown.
>
> 99. When a train stops under circumstances in which it may be overtaken by another train, the flagman must go back immediately with flagman's signals a sufficient distance to insure full protection, placing two torpedoes, and when necessary, in addition, displaying lighted fusees.
> * * *
>
> When a train is moving under circumstances in which it may be overtaken by another train, the flagman must take such action as may be necessary to insure full protection. By night, or by day when the view is obscured, lighted fusees must be thrown off at proper intervals.
> * * *.

201. For movements not provided for by time-table, train orders will be issued. * * *

Rules 284 and 289A define cab-signal aspects as follows:

Aspect	Indication	Name
Green	---Proceed	---Clear
Red	---Proceed at Restricted Speed, Not Exceeding 15 Miles Per Hour	---Restricting

Restricted speed is defined as follows:

> Proceed prepared to stop short of train, obstruction, or anything that may require the speed of a train to be reduced.

Rule 86 of the time-table special instructions reads in part as follows:

> Between Otto and Centralia second class and inferior trains may run ahead of overdue first class trains but will keep advised of and avoid delay thereto.
> * * *

The Champaign District extends between Otto and Centralia.

Bulletin instructions to enginemen operating locomotives equipped with automatic train-stop devices are in part as follows:

> * * * UNDER NO CONDITION SHALL TRAIN STOP ELECTRIC CAB SWITCH BE CUT-OUT when operating over automatic train stop territory, regardless of movement, except on second engine when double heading. * * *

A reissue of a general notice, dated January 1, 1939, addressed to enginemen on the Champaign District, reads as follows:

> In order to safeguard against train-stop engines being dispatched over train stop territory on runs where enginemen take care of engines enroute or enter train-stop territory enroute, a test must be made in the following manner:

When engine is standing on energized track and cab signal displayed green, open train stop cab switch and after brake pipe starts exhausting, close train stop cab switch. When equalizing gauge has dropped 20 lbs. move brake valve handle to lap position and when brake pipe exhaust ceases, move brake valve handle to running position, releasing brakes. The time required for making this test is about one minute with an 18-car train.

This will be the enginemen's assurance that train stop device is cut in and working properly.

It should be thoroughly understood that this test applies on through runs of engines at Centralia northward and Champaign southward.

The maximum authorized speed for passenger trains between Champaign and Mattoon is 80 miles per hour.

The weather was misty and there were fog pockets at the time of the accident, which occurred about 12:45 p. m.

Description

No. 87, a south-bound second-class freight train, with Conductor Wildman and Engineman Hammersmith in charge, consisted of engine 2504, 137 cars, and a caboose. At Champaign, 44.6 miles north of Mattoon, the crew received a message reading as follows:

Pick up Centralia loading at Mattoon and Odin. Use 10 mins on No. 1.

This train departed from Champaign at 10:30 a. m., according to the train sheet, 4 hours 45 minutes late. At Tuscola, 22.6 miles north of Mattoon, the crew received a message reading as follows:

Can run you over northward track out of Mattoon if necessary.

This train departed from Tuscola at 11:34 a. m., stopped at Mattoon between 12:30 and 12:38 p. m., according to the statements of the crew, and about 12:45 p. m. the rear end was struck by No. 1.

No. 1, a south-bound first-class passenger train, with Conductor Jolly and Engineman Walkup in charge, consisted of engine 2408, one mail car, one express car, one baggage car, four coaches, one club car, and one Pullman sleeping car, in the order named. All cars were of steel construction. This train departed from Champaign at 11:59 a. m., according to the

train sheet, 9 minutes late, departed from Tuscola, the last open office, at 12:20 p. m., 4 minutes late, passed Dorans, 4.9 miles north of Mattoon, and the last station where time is shown, 7 minutes late, according to the evidence, and, while moving at a speed estimated to have been between 15 and 25 miles per hour, collided with the rear end of No. 87.

Engine 2408, of No. 1, stopped approximately 136 feet south of the point of collision. The smoke box telescoped the caboose of No. 87 and the engine truck and one pair of drivers were derailed; the front end of the engine, including the automatic train-stop equipment, was badly damaged. The caboose of No. 87 was demolished; seven empty tank cars immediately ahead of the caboose were derailed at various angles in a mass of wreckage which blocked the northward main track.

The train-service employee injured was the fireman of No. 1.

Summary of Evidence

Engineman Hammersmith, of No. 87, stated he received a message at Tuscola advising him that his train could run over the northward track south of Mattoon in order to clear the southward track for No. 1; he expected the switches to be lined so that his train could move promptly to the northward track; however, when his train arrived at Mattoon at 12:30 or 12:35 p. m., a north-bound train was blocking the cross-over. Water was taken, eight cars were set off, the engine was recoupled to the train, and it was ready to proceed at 12:45 or 12:46 p. m., at which time the north-bound train was still blocking the cross-over. He stated that he had received a message to use 10 minutes on No. 1 and for that reason he did not sound the signal for the flagman to protect the rear end when his train stopped at Mattoon.

Fireman Scott and Front Brakeman Farris, of No. 87, corroborated the testimony of their engineman in all essential details.

Conductor Wildman, of No. 87, stated that his train passed Dorans at 12:18 p. m.; he received one message instructing him to use 10 minutes on No. 1 and another message informing him that if necessary his train would move over the northward track south of Mattoon. The caboose markers were lighted because of the weather. When the speed was reduced approaching Mattoon no fusee was dropped because he did not expect that his train would be delayed in crossing over to the northward track. His train stopped at Mattoon at 12:36 p. m. After observing the flagman get off and start to run northward, he started toward the front end of his train and had reached a point 39 car lengths forward

from the caboose when the collision occurred. The time of the accident was between 12:44 and 12:46 p. m. It was customary to receive instructions by message with regard to using time on a following superior train. He understood that the message did not signify No. 1 was 10 minutes late; also he understood that No. 87 should have cleared or protected against No. 1 at 12:34 p. m., which was the time No. 1 was due to leave Dorans.

Flagman Taylor, of No. 87, stated that, although the weather was hazy, it was possible to see a distance of 150 or 160 car lengths, consequently, when the speed of his train was reduced approaching Mattoon he did not think it necessary to drop a lighted fusee. Immediately after the train stopped at Mattoon he started back to flag and, when only 2 or 3 car lengths to the rear of the caboose, he observed No. 1 approaching about 2 miles distant, whereupon he lighted a fusee and waved stop signals as he ran toward the approaching train. He had reached a point about 25 car lengths north of the caboose when No. 1 passed him at a speed of 60 or 65 miles per hour. No. 87 stopped at Mattoon at 12:37 or 12:38 p. m. and the collision occurred at 12:42 or 12:43 p. m. He thought the message implied that No. 1 was 10 minutes late and conferred right on No. 87 to use 10 minutes on No. 1's schedule, but that it was necessary to protect against No. 1 after its schedule time at Dorans.

Engineman Walkup, of No. 1, stated that at Champaign he took charge of engine 2408, which was on No. 1 from Chicago. An air-brake test was made at Champaign but the automatic train-stop system was not tested and he failed to cut in the main switch at that point, as he was required to do before entering the automatic train-stop territory ahead. Station stops were made at Tuscola and Arcola and the brakes functioned properly at both places. The wayside signal aspects at the interlockings which No. 1 passed were in clear view a distance of about 1 mile and, as these signals came into view before the block-indication points were reached, he did not observe that the cab signal was not functioning. When approaching Mattoon he and the fireman simultaneously observed the flagman of No. 87 at a point about 1,500 feet north of the caboose of that train, waving a lighted fusee. He immediately placed the brake valve in emergency position and opened the sand valve; at this time his train was moving at a speed of about 80 miles per hour and the engine was about 2,500 feet north of the caboose of No. 87. He observed that the cab signal was not displaying an indication and realized then, for the first time, that the automatic cab-signal and train-stop system was not cut in service. He turned the main switch, located above his cab window, to the "on" position and immediately the cab signal displayed a red aspect. The speed of his train was 15 or 20

miles per hour at the time of the collision, which occurred at 12:45 p. m. He did not receive either orders or instructions for No. 1 to run late. He passed Dorans 7 minutes late. He had been assigned as engineman on No. 1 about 5 years. He could not explain his failure to cut in the automatic cab-signal and train-stop system before leaving Champaign, nevertheless, he was positive that he did not have the system cut in at any time until after he saw the flagman's stop signals, and said that he had not even thought of it during the trip. Nothing unusual had occurred to distract his attention during the run from Champaign to the point of accident.

Fireman Meyers, of No. 1, stated that after relieving the incoming fireman of No. 1 at Champaign he was busy with routine duties and did not observe that the engineman had not cut in the automatic train-stop device. The air brakes were tested, the rear car was set off, and then No. 1 left Champaign. No orders or instructions for their train to run late were received. The water in the boiler had a tendency to rise and he had blown it down two or three times after leaving Champaign; his attention was distracted by this duty. When approaching Mattoon his train was moving at a speed of 65 or 70 miles per hour and was running about 5 minutes late. At a point about 1/2 mile north of the point of accident he and the engineman observed the flagman of No. 87 waving a lighted fusee; he thought the flagman was standing at a point about 12 or 14 car lengths north of his caboose. The engineman immediately made a heavy brake-pipe reduction which was effective but too late to avert the collision, which occurred about 12:42 or 12:43 p. m. The weather was misty and there were fog pockets; he was unable to see the caboose of No. 87 until soon after he observed the flagman. He estimated that the speed of the train, when he got off the engine shortly before the collision occurred, was 20 or 25 miles per hour. The wayside signals at the three interlockings between Champaign and the point of accident were displaying clear indications. He knew that the train-stop warning whistle should have sounded at these points but as his attention was distracted by other duties, he failed to observe the absence of whistle signals; he had no reason to think that the system was not cut in. He did not observe the absence of cab-signal aspects between Champaign and Mattoon as when in his usual position his view of the cab signal is obscured by the boiler head. He had worked with this engineman for 15 or 20 years and knew of no instance previous to this occasion wherein he had failed to cut in the automatic cab-signal and train-stop system.

Conductor Jolly, of No. 1, stated that his train departed from Champaign 9 minutes late and that he did not receive any orders or instructions for his train to run late. The regular stop was made at Tuscola and his train departed from that station 5 minutes late. A flag stop was made at Arcola. The

train passed Dorans at 12:40 or 12:41 p. m. When approaching Mattoon, at a speed of not less than 60 miles per hour, the air brakes became applied in emergency and, after moving a distance of about 2,500 feet, his train struck the rear end of No. 87, at which time the speed of the train had been reduced to about 20 miles per hour. The accident occurred at 12:44 or 12:45 p. m. He had never received orders for his train to run late, regardless of how late it was running.

The statement of Baggageman Myron, of No. 1, added nothing of importance.

Flagman Hardsock, of No. 1, stated that he was in the rear car at the time of the accident. When the train was approaching Mattoon, at a speed of 65 or 70 miles per hour, the air brakes became applied in emergency, whereupon he looked out the car window and observed the reflection of a fusee. The train moved a short distance and then struck No. 87, at which time the speed had been reduced to 20 or 25 miles per hour. The accident occurred at 12:45 p. m. He went back immediately to provide flag protection and observed the flagman of No. 87 holding a lighted fusee at a point 6 or 7 car lengths north of the rear end of No. 1. Reaching the location of the flagman of No. 87 he observed that the fusee was still burning and about one-half of it remained. A light rain was falling and fogginess in places restricted visibility to 35 or 40 car lengths.

Train Dispatcher Granger stated that it is the usual practice to give an inferior train time on a following superior train by message and not to issue a copy of such message to the superior train. On the day of the accident he gave No. 87 a message to use 10 minutes on No. 1, but No. 1 made up more time than is usual for that train in the territory involved. At the last reporting station No. 1 was 4 minutes late.

Train Control Supervisor Kelly stated that locomotive 2408 was equipped with the pneumatic type of automatic train-stop device; with this type the pneumatic portion of the device is sealed at all times; however, the engineman can open the main electric switch of the device without disturbing the seal on the cut-out cock of the pneumatic portion and then, within a 6-second period, operate the acknowledging valve and thus render the automatic train-stop device inoperative. The automatic cab-signal and train-stop equipment on a locomotive is tested before leaving Chicago and then is cut out electrically over the non-equipped territory to Champaign. Before the train leaves Champaign the electric swtich is operated to cut the system in service and a departure test of the automatic train-stop device is made. He said that at three interlocking plants between Cham-

paign and Mattoon, namely, Tolono, Arcola, and Tuscola, there are dead sections in the track and a locomotive operating over this territory with the automatic train-stop system cut in would get a distinct signal from the automatic train-stop warning whistle at these points.

Traveling Engineer Buckles stated that he arrived at the scene of the accident soon after 2 p. m. and at that time inspected engine 2408. He observed that the electric switch of the automatic cab-signal and train-stop device was in the cut-in position, but no light in the cab signal was burning because the train-stop equipment was demolished in the collision. The automatic brake-valve was in emergency position.

Superintendent Downs stated that train dispatchers were authorized by the management to issue a message authorizing an inferior train to use an extension of time on the schedule of a following superior train, but this message does not confer right on the inferior train and is used only to expedite movement of an inferior train. Rule 86 of the current timetable does not supersede Rule 86 of the transportation rules, but is supplemental to that rule and the employees are so instructed. Under the management's interpretation of the rules, the flagman of No. 87 should have thrown off lighted fusees when his train first reduced speed approaching Mattoon, as provided in Rules 93 and 99, since the message they held was not an order for No. 1 to run 10 minutes late. The interpretation of Rule 201 is that the chief dispatcher has authority to issue train orders for movements not provided for by time-table authority; a message cannot be issued in lieu of a train order when the superiority of a train is restricted. In this instance it was not intended to confer right on the preceding inferior train; consequently, the following superior train was not restricted. The message to No. 87 was issued solely to advance the movement of that train. This practice and the rules involved have been in effect since February 5, 1919. Fusees used are of 10-minute size. Engineman Walkup had been instructed on the automatic train-stop device and cab-signals when they were put in service in 1925 and at each air-brake examination since that time; the last examination was in 1938. Observations are made frequently by officials in regard to employees' observance of train-stop test requirements, but records of these observations are not kept. The train-stop equipment on engine 2408 was tested prior to its departure from Chicago on the day of the accident. He said that a test conducted several years previous to this accident disclosed that an 8-car passenger train, moving at a speed of 80 miles per hour, could be stopped in 5,365 feet by an automatic train-stop brake application. An emergency brake application should stop a 9-car train, moving at a speed of 80 miles per hour, in approximately 3,475 feet.

Observations of the Commission's Inspectors

The Commission's inspectors observed the departing test made on two sections of a train at Champaign on November 22; these tests were made in accordance with the instructions issued by this railroad.

Discussion

No. 87, a second-class train, was occupying the southward main track at Mattoon on the time of No. 1, a superior train in the same direction, by authority of a message containing instructions to use 10 minutes on the schedule time of No. 1. The preceding train, because of conflicting movements at Mattoon, was unable to clear on the northward main track and stopped at Mattoon between 12:30 and 12:38 p. m.; its rear end was struck by No. 1 at 12:45 p. m. Although aware that No. 1 was due to leave Dorans, the last station where time was shown for No. 1, at 12:34 p. m., the flagman of No. 87 did not drop lighted fusees when his train reduced speed approaching Mattoon as required by the rules. He waited until his train stopped before providing flag protection, but according to the evidence, No. 1 was following closely and he did not get back a sufficient distance to provide adequate stopping distance for No. 1. Although the track was tangent a distance of several miles, weather conditions restricted visibility to the extent that the members of the engine crew on No. 1 said that they could not see the lighted fusee held by the flagman until 2,500 feet distant from the caboose of No. 87. The flagman said because of the message to use 10 minutes on No. 1, he understood that No. 1 was 10 minutes late, but that it was necessary to provide flag protection when No. 1 was due at the last station in the rear where time was shown. The conductor of No. 87 said that he had not required lighted fusees to be dropped when approaching Mattoon as he had anticipated no delay in clearing for No. 1. He understood that protection should have been provided against No. 1 on its schedule time at Dorans. The superintendent stated, in effect, that No. 87 was required to protect the same as though the crew had not received the message.

There was considerable discrepancy in the testimony with respect to the time No. 87 stopped at Mattoon and the time the accident occurred. The preponderance of evidence was to the effect that the train stopped about 12:35 p. m. and the accident occurred about 12:45 p. m. According to the statement of the flagman he had from 4 to 6 minutes in which to provide flag protection and he had reached a point about 1,000 feet to the rear of his train when No. 1 passed him. The weight of evidence indicates that he had about 10 minutes in which to provide flag protection. Proceeding to the rear at a rate of 4 miles per

hour the flagman should have reached points 1,408 feet, 2,112 feet, and 3,520 feet distant, respectively, in 4, 6, and 10 minutes. The track was tangent but undulating and visibility was restricted by fog pockets. Under these conditions and in view of the stopping distance required for a train moving at a speed of 80 miles per hour, and since the engine crew of No. 1 saw the flagman a distance of only about 1,500 feet, it is apparent that the flagman should have been back not less than 3,500 feet to provide adequate protection. The flagging rule required that by day when the view was obscured, as was the condition when approaching Mattoon, lighted fusees must be dropped at proper intervals. If the flagman had dropped lighted fusees when his train started to reduce speed when preparing to stop at Mattoon it is probable that this accident would have been averted.

The territory between Chicago and Champaign is not equipped with the automatic cab-signal and train-stop system and the apparatus on engines operating over this territory is cut out. When an engine is operated over equipped territory, the engineman in charge at the entrance to equipped track is required by the rules to cut in the automatic cab-signal and train-stop apparatus and make a departure test. The engineman of No. 1, who had been assigned to this run for 5 years past and who was familiar with train-stop operation, took charge of engine 2408 at Champaign and said that through an oversight, he failed to cut in the automatic cab-signal and train-stop apparatus and to make the usual departure test. Under existing instructions the engineman was not permitted to have the train-stop electric cab-switch cut out when operating in automatic train-stop territory. The trip prior to the accident was without unusual incident and his attention was not distracted from his customary duties. Although the train-stop warning whistle should have sounded at dead-section portions of track at three interlockings en route, provided the train-stop apparatus was cut in, he could not explain his failure to observe the absence of audible signals at these points. His explanation for failing to observe the absence of a cab-signal aspect at the dead-sections was that he could see the wayside home signals a distance sufficient to permit the train to be operated at maximum speed. He said that it did not occur to him to look at the cab signal until after he had observed the flagman's signals. As this engineman had for several years operated engines with cab-signal equipment over the territory involved, it seems almost incredible that he would proceed from Champaign without cutting in the automatic train-stop and cab-signal devices, in view of the fact that there were no wayside signals except at interlockings, and that he could operate his engine a distance of 44 miles during a period of about 46 minutes and not realize that the cab signal, which was located practically in front of him, was not displaying an aspect. The fireman of No. 1 said that duties

distracted his attention to the extent that the absence of audible warnings at the three interlockings en route was not observed; when seated in his usual position the view of the cab-signal aspects was obscured by the boiler head; consequently, he failed to observe that the train-stop apparatus was inoperative. The engineman of No. 1 said that he had received neither orders nor instructions to run late, and was but 7 minutes late passing Dorans. The speed was 80 miles per hour when approaching Mattoon. Weather conditions so restricted visibility that when the engine crew of No. 1 first observed a lighted fusee being waved across the track, the distance was insufficient to stop the train moving at a speed of 80 miles per hour short of the preceding train. The engineman immediately placed the brake valve in emergency position but it was then too late to avert the accident. Had the engineman and the fireman complied with the requirements of rules 27 and 34 and the bulletin instructions covering operation in automatic train-stop territory undoubtedly the inoperative condition of the cab-signal and train-stop apparatus would have been discovered and corrected in time to indicate that the track ahead was occupied, and in all probability the accident would have been prevented.

Conclusion

This accident was caused by failure to provide proper flag protection for the preceding train and by operation of the following train in automatic train-stop territory with the automatic train-stop and cab-signal devices cut out, contrary to current instructions, resulting in an imperfectly displayed cab signal.

Respectfully submitted,

S. N. MILLS

Director.