Inv-2076

INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE

MICHIGAN CENTRAL RAILROAD

WAYNE JCT., MICH.

JULY 5, 1936

INVESTIGATION NO. 2076

SUMMARY

Railroad:	Michigan Central		
Date:	July 5, 1936		
Location:	Wayne Jct., Mich.		
Kind of accident:	Rear-end collision		
Trains involved:	Passenger	:	Freight
Train numbers:	No. 40	:	Second JS-2
Engine numbers:	8224	:	368
Consist:	13 cars	:	53 cars and caboose
Speed:	15-50 m.p.h.	:	Standing
Track:	Tangent for several miles; accident occurred on passing track		
Weather:	Clear		
Time:	3:22 a.m.		
Casualties:	1 killed; 5 injured		
Cause:	Open switch, bolt lodged between switch point and stock rail preventing switch from being closed and locked and permitting improper display of proceed signal indications.		

To the Commission:

On July 5, 1936, there was a rear-end collision between a passenger train and a freight train on the Michigan Central Railroad near Wayne Jct., Mich., which resulted in the death of 1 employee, and the injury of 3 passengers, 1 mail clerk, and 1 employee. This accident was investigated in conjunction with a representative of the Public Utilities Commission of Michigan.

Location and method of operation

This accident occurred on that part of the Detroit Division extending between Detroit and Jackson, Mich., a distance of 74.07 miles. In the vicinity of the point of accident this is a double-track line over which trains are operated by timetable, train orders, an automatic block-signal system, and an automatic train-stop system of the intermittent-inductive type; under the rules, trains move with the current of traffic by block signals whose indications supersede timetable authority. The accident occurred a little more than 1 mile west of Wayne Jct., on a passing track which is 6,000 feet in length and is located on the south side of the main track, the point of accident being 687 feet from the west switch of this passing track, this being a facing-point switch for eastbound trains. Approaching from the west, the track is tangent for more than 8 miles; the grade for some distance is slightly descending and is 0.16 percent at the point of accident.

The signals directly involved in this accident are automatic signals 192, 202 and 214, located 404, 6,098, and 12,107 feet, respectively, west of the passing-track switch. These signals are of the upper-quadrant, 3-position, semaphore type, approach lighted; in addition, these three signals are equipped to display three-block indications by the addition of a yellow light to the left of the signal mast, below the semaphore arm. The indications displayed by these signals are as follows: Red, stop then proceed at restricted speed; single yellow, prepare to stop at next signal, train exceeding medium speed (a speed not exceeding 30 miles per hour) must at once reduce to that speed; double yellow, prepare to stop at second signal; green proceed. The additional yellow light to the left of the signal mast is referred to as a "Double-distant signal"; at signal 202, under this double-distant signal, there is a take-siding signal, controlled from the interlocking tower at Wayne Jct., and arranged to display a flashing red light. Turnout switches are equipped with switch circuit controllers adjusted so as to open the contacts when the switch point controlling both sides of the signal control circuits is open 1/4 inch. Automatic train-stop inductors are located approximately 70 feet in the rear of the

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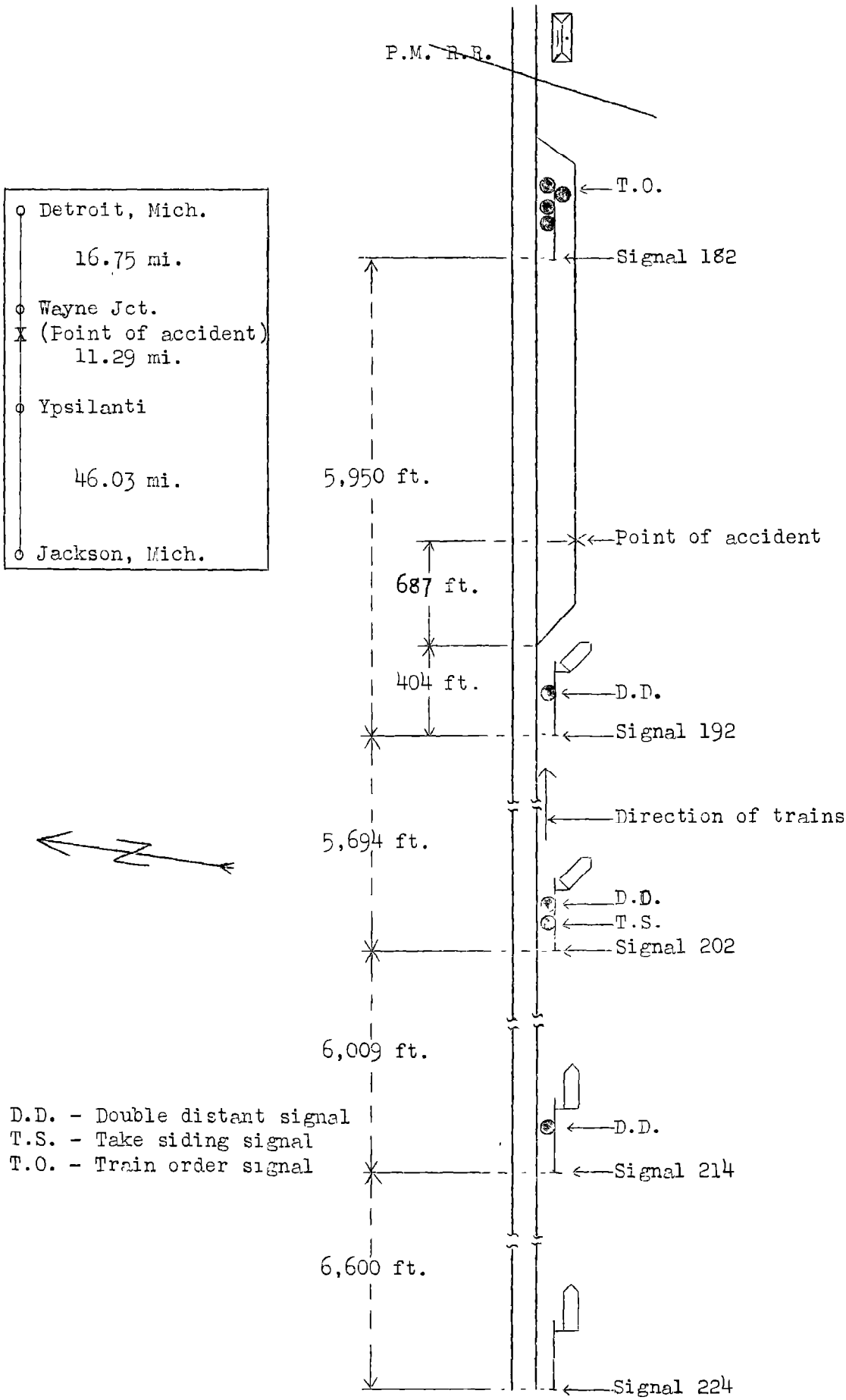

signals, or the point at which a train will shunt the track circuit in advance. The inductor circuits are so arranged that an inductor will cause the brakes to be applied automatically only when a restrictive signal indication is displayed.

The weather was clear and day was breaking at the time of the accident, which occurred about 3:22 a.m.

Description

Train Second JS-2, an east-bound freight train, consisted of 55 cars and a caboose, hauled by engine 368, and was in charge of Conductor McAllister and Engineman Stowe. This train passed Ypsilanti, Mich., 11.29 miles from Wayne Jct and the last open office, at 3:04 a.m., according to the train sheet, stopped and then headed in on the passing track at Wayne Jct. at about 3:20 a.m. The train was standing on the passing track, with the switch open and the caboose 687 feet from the switch, when it was struck by Train No. 40.

Train No. 40, an east-bound passenger train, consisted of 1 express refrigerator car, 2 mail cars, 1 combination car, 1 coach, 3 Pullman sleeping cars, 1 lounge car, 3 Pullman sleeping cars and 1 coach, in the order named, hauled by engine 8224, and was in charge of Conductor Vetterly and Engineman Smeed. The refrigerator car was of steel-underframe construction and the other cars were of all-steel construction. This train passed Ypsilanti at 3:13 a.m., according to the train sheet, 1 minute ahead of time, and was approaching Wayne Jct. when it entered the open passing-track switch and collided with the rear of Train Second JS-2 while traveling at a speed variously estimated to have been between 15 and 50 miles per hour.

The caboose and four rear cars of the freight train were demolished and the next two cars in that train were badly damaged. Engine 8224 was derailed to the right and stopped on its right side approximately 249 feet east of the point of accident, partly buried under the wreckage of several box cars, and was badly damaged. The first three cars in Train No. 40 were derailed but remained upright, and none of the other equipment in this train was derailed or damaged. The employee killed was the engineman of Train No. 40 and the employee injured was the fireman of that train.

Summary of evidence

Engineman Stowe, of Train Second JS-2, said he received a take-siding indication at signal 202 and stopped at the passing-track switch. It was about 3:20 a.m. when he stopped again after pulling in on the passing track and waited for a signal to

pull ahead on that track. Engineman Stowe noticed that signal 182, the home interlocking signal at Wayne Jct., which is the next signal east of automatic signal 192, was blinking, lighting up and going dark on three or four occasions, thus indicating that trouble was being experienced in closing the passing-track switch; looking back, he saw Train No. 40 head in and collide with his train. Fireman Mitchell in general corroborated the statements of Engineman Stowe; he stated also that when approaching the rear end of Train No. 40 after the accident, preparatory to pulling it back on the main track, the signal in the rear of that train was in stop position.

Head Brakeman McNamara, of Train Second JS-2, said the switch light was burning when his train reached the passing-track switch; on opening the switch, he found it difficult to operate, but he did not see anything to prevent the switch from being operated and after he had opened it the points seemed to fit properly.

Conductor McAllister, of Train Second JS-2, said his train stopped prior to heading in and that the flagman got off the caboose but did not put down a torpedo, the train standing at that point only about 30 seconds. The train then pulled ahead and stopped on the passing track at 3:20 a.m.; the flagman closed the switch far enough for him to see the green color; the conductor thought the switch was closed and turned the caboose markers. As Train No. 40 approached he was blinded to some extent by the headlight of that train; he got off and walked across the tracks to inspect Train No. 40 as it passed and he then saw that the flagman was giving emergency stop signals with a fusee and that the switch was lined for the passing track. Conductor McAllister at first thought the approaching train was traveling too fast to enter the switch, and he estimated that it was traveling at a speed of 15 or 20 miles per hour when it collided with his own train.

Flagman Henderson, of Train Second JS-2, stated the he got off when his train stopped preparatory to heading into the passing track, but did not put down any torpedoes or fusees because his train was not in danger of being overtaken and he could have seen a following train several miles distant. He said Train No. 40 could be seen when it rounded the curve at Wiard, a station about 8½ miles west of Wayne Jct., and he first saw it after his train had started to pull into the passing track. He got off the caboose and tried to close the switch, and then set down his lantern and tried again to close the switch, but was unable to do so; Flagman Henderson then opened the switch, at which time it seemed to work freely, and stepped over and looked at the points, but did not see any indication that it had been run through, nor did he see any stone or other foreign

object in the points. Altogether, the flagman said he made 7 or 8 attempts to close the switch, and finally, when Train No. 40 was a short distance west of signal 192, which at that time was in stop position, he left the switch securely fastened in open position and lighted a fusee and flagged the approaching train from the engineman's side of the track; he said the brakes had been applied and that fire was flying from the wheels when the head end of the train passed him at a speed he estimated to have been 35 or more miles per hour; he did not make any examination of the switch after the accident.

Fireman Dennis, of Train No. 40, said signal 214 was displaying green and that signal 202 first displayed double yellow and then bobbed back and forth from double yellow to green, doing this on three different occasions; Engineman Smeed reached for the forestalling lever of the automatic train-stop device, but the whistle did not blow, indicating to the fireman that the signal was green when the engine passed it. When approaching signal 202, the engineman had made a light application of the brakes, about a 7 or 8-pound reduction, but after passing that signal the fireman said signal 192 lighted up and displayed a green indication and the engineman then released the brakes, and that the maximum speed of the train between these two signals was 70 or 75 miles per hour. Fireman Dennis could not say positively that he watched signal 192 continuously, as he thought he might have reached for the blower, shut off the stoker, or turned around to look at something, but he was positive that the signal was displaying green or proceed at all times while he was watching it, looking through the front window, until his view was cut off by the front end of the engine, and it was about this time that he saw someone light a fusee; he was satisfied that the engine then had passed the signal. The speed was about 60 miles per hour and he said the engineman immediately applied the air brakes in emergency; the fireman did not think that this application resulted from the operation of the automatic train-stop system. The fireman said he was not worrying about anything, even though the engineman said "Look out, we're going to hit," because he could see the cars and thought the engineman might be seeing a shadow of some kind, but when the engine entered the switch the fireman realized that there was something wrong; when the engineman called to him he thought the engineman must have had some warning, in addition to the fusee, that the fireman had not seen. Fireman Dennis estimated the speed at the time of the collision to have been about 50 miles per hour. The fireman further stated that he did not notice the switch stand or the markers of the caboose, neither did he see the changing indication of interlocking signal 182, which was caused by the efforts of the flagman in trying to close the switch; it also appeared from his statements that everything about the engine was in good condition, including the

operation of the automatic train-stop device, and that Engineman Smeed had appeared to be in his usual good health.

Conductor Vetterly, of Train No. 40, who was in the fourth car, said the air brakes were tested prior to leaving Chicago, Ill., and that they worked properly in making various stops en route; a brake test was also made when enginemen were changed at Kalamazoo. The conductor further stated that when approaching Wayne Jct. the speed of the train was about 70 miles per hour and that he did not notice any application of the brakes prior to the emergency application which he thought was made about the time the engine encountered the open switch. He looked at his watch and thought it was 3:26 a.m. when the train stopped. Head Brakeman McGibbon, who also was in the fourth car, said he felt an application of the air brakes about 10 car lengths west of the switch and that it was 3:21 a.m. when the train stopped at the time of the accident.

Flagman Keeland, of Train No. 40, who was in the rear of the last car, said that after the collision he saw someone near the rear of his train with a red fusee, and after getting off he saw that the switch was open and the switch light red.

Engineman Goebel, who was deadheading on Train No 40, also was in the fourth car; he thought there was an emergency application of the brakes about a train length from the switch and that the train entered the switch at a speed of about 50 miles per hour. After the accident he saw a fusee near the rear of the train and then went to the head end, located Engineman Smeed, and accompanied him to a hospital, and he quoted Engineman Smeed as saying that the signal was clear and that he was not to blame for the accident. Engineman Weiss, also deadheading on Train No. 40, said that after locating Engineman Smeed he went back to the rear of the train and saw that the switch was open, with the points fitting properly; he did not try to operate the switch.

Night Operator Allward, on duty at Ypsilanti, said the dispatcher told him to display the head-in signal for the freight train when it was approaching his station, but the signal failed to operate properly due to the bulb having been burned out, and he then tried to hand on a message with instructions to head in at Wiard, but afterwards found that the hoop had been dropped with the message still attached to it. Towerman Wilson, on duty at Wayne Jct., said he received instructions from the dispatcher to display the head-in signal for the freight train, which had just passed Ypsilanti, and that he acted accordingly; the train came upon the annunciator circuit, which begins at signal 214, at 3:14 a.m. and the caboose cleared the circuit, which ends at signal 192, at 3:20 a.m. He notified

the dispatcher at once that the train was in the clear and he had just finished talking with the dispatcher when Train No. 40 entered upon the circuit, only 15 or 20 seconds after the caboose of Train Second JS-2 had cleared it. Dispatcher Beitler said it was between 3:24 and 3:25 a.m. when the conductor of Train Second JS-2 notified him of the occurrence of the accident.

General Superintendent Margetts reached the scene of the accident about 4:30 a.m., and after the rear end of Train No. 40 had been pulled back on the main track he instructed Trainmaster Campbell to close the switch, which at that time was lined and latched for the passing track. The trainmaster was unable to close the switch, the points being open at least $\frac{1}{2}$ inch, while the switch point was raised as if something might be under it. The switch then was opened again, and about 5 feet from the end of the switch point a bolt was found which had fallen out of the reinforcing bar and was on a tie between the switch point and the south rail; this bolt measured $3\frac{1}{4}$ inches in length and was nearly $\frac{5}{8}$ inch in diameter. After the trainmaster had tried again, unsuccessfully, to close the switch the general superintendent picked up the bolt, examined it, and located the place where it had worked out of the switch point; the washer was lying on a tie-plate and the nut and cotter key were on the ballast between the second and third ties east of the switch tie. The switch point was in good condition and fitted properly after the removal of the bolt. Several tests were made with the bolt in the position in which it was found, for the purpose of determining whether the signal would go to proceed position, but at no time was that result obtained. It also appeared from the statements of General Superintendent Margetts that a test showed that the bolt in question could not come out of its proper position except when the switch was open, the conclusion being reached that the bolt came out when the switch was opened to allow Train Second JS-2 to enter the passing track.

Road Foreman of Engines McDermott said he found the throttle partly open and the brake valve in emergency position, while the actuator of the automatic train-stop device was pointed forward or away from the engineman, indicating that there had not been an automatic application of the air brakes. Examination of the driving wheels showed that there were small flat spots on all three of the driving wheels on the left side, and in connection with the questioning of the road foreman of engines the general superintendent stated that sand began to appear on the rails of the passing track about 65 feet east of the switch point, but did not continue for any great distance. Engineman Doherty, who handled the engine from Chicago to Kalamazoo, said he had tested the automatic train-stop apparatus on

the test track at Chicago; when passing over the first inductor he forestalled and the whistle sounded, and at the second inductor he received an automatic brake application. Engineman Doherty also said that he encountered a yellow signal when approaching Kalamazoo and that the whistle in the cab sounded at that time.

Section Foreman Fedakis said he made a track inspection on the morning of July 4, and during the course of this inspection he passed the switch involved in this accident, moving on his motor car at a speed of about 5 miles per hour; at that time the switch points were in proper position and he could see that the switch lock was in place and locked, but he did not stop to ascertain whether all of the bolts in connection with the switch were tight.

Subsequent examination and tests were made in which the Commission's representatives participated; in making these tests the switch was operated in a manner similar to that described by the flagman of Train Second JS-2, with a bolt placed as nearly as possible in the position in which the bolt was found after the accident. In the first tests it was found that by applying considerable force it was possible for the switch to be closed far enough for signal 192 to assume the proceed position, and at the time of these tests it was noted that there was about 1/8 inch lateral movement of the stock rail. In other tests it was noted that it was possible to observe signal indications for at least three blocks ahead of an engine, and to note changes in the indications of signal 192; also while standing at the switch it was noted that interlocking home signal 182 could be observed changing from green to dark as the switch was manipulated. From these tests it was believed possible that the flagman's efforts to close the switch caused the bottom portion of the switch point, to which the switch controller is connected, to become so nearly closed that the signal line control circuit was completed long enough for the signal to move from stop to proceed, which movement would require between 8 and 9 seconds, but this position would be held only as long as maximum pressure was exerted on the switchstand lever. It did not appear that there was anything wrong with the signal system. The automatic train-stop mechanism on engine 8224 was torn off and damaged in the accident and no tests could be made, but the work reports for a period of more than 30 days showed that only minor repairs to the engine had been required and that no exceptions had been taken to the automatic train-stop mechanism, nor were any repairs to this mechanism required or made.

Discussion

The investigation of this accident developed that Train Second JS-2 received a head-in signal at signal 202 and stopped at the west switch of the passing track while it was being opened by the head brakeman. This stop was only momentary, and the flagman did not put down torpedoes or leave fusees, there being no danger of his train being overtaken, as a following train would be visible for several miles. After the train entered the siding switch the flagman tried to close the switch, but was unable to do so; he examined the points, made several further efforts to close the switch and then left it open and lighted a fusee, at which time Train No. 40 was a short distance west of signal 192, which he could see in stop position.

The fireman of Train No. 40 said clear signals were displayed for the movement of his train until signal 202 lighted up, after passing signal 214, and that signal 202 displayed alternately a double yellow indication and then green, repeating this operation several times. According to his statements, the engineman made a light application of the brakes and reached for the forestalling lever of the automatic train-stop device, but the whistle did not sound in the cab, indicating that the signal was at proceed when the engine passed it. The engineman released the brakes when the succeeding signal, 192, lighted up and displayed a green indication, the fireman saying this latter indication was displayed all the time the signal was under his observation and that his first knowledge of anything wrong was when he saw a fusee being lighted; he did not notice the switch or the switch stand, the markers of the caboose on the siding, or the intermittent lighting up of home interlocking signal 182.

Examination of the switch after the accident disclosed that one of the bolts which had held the reinforcing bar of the switch point had become lodged between the normally closed point and the stock rail, about 5 feet from the point, which prevented the flagman from closing and locking the switch. Subsequent tests developed the fact, however, that by the use of considerable force it was possible to move the switch point far enough toward the closed position to cause signal 192 to assume the proceed position, but this position could be held only as long as the maximum pressure was exerted on the switch lever. The washer, nut and cotter key which had been used to secure the bolt in its proper position were found near by, but the investigation did not develop how these parts, or the bolt itself, came to be in the positions in which they were found after the accident.

Flagman Henderson said he made 7 or 8 attempts to close the switch; if in these various attempts he was able to get the points over far enough to close the circuit controller contacts this would account for the green indication of signal 214 and the operation of signal 202 between double yellow and green in accord with the statement of Fireman Dennis; however, Fireman Dennis also said that signal 192 was green all the time he saw it, but if Flagman Henderson was still endeavoring to close the switch it does not appear that a steady green indication would have been displayed by that signal; instead it should have operated between red, double yellow, yellow and green each time the circuit controller contacts were closed after Train No. 40 had passed signal 202. When Flagman Henderson ceased his efforts to close the switch and latched it in open position, signal 192 should have displayed red continuously; after the accident it was found to be in that position. The fireman may not have watched signal 192 continuously, and it is possible that when the flagman finally left the switch in open position, the engine of Train No. 40 was close enough to signal 192 for its front end to cut off the fireman's view, resulting in his failure to see the red indication which should have been displayed at that time. The engineman, however, prior to his death, stated that he had a green signal, and the examination of the actuator in the cab of the engine after the accident indicated that the application of the brakes which was made immediately prior to the accident must have resulted from the action of the engineman and not from the functioning of the automatic train-stop device. Other than the bolt under the switch point, the investigation did not disclose anything wrong with the signal system or its appurtenances.

Conclusion

This accident was caused by an open switch, due to a reinforcing-bar bolt having become lodged between the normally closed switch point and the stock rail in such manner as to make it impossible to close and lock the switch and to permit the improper display of proceed signal indications. The reason for the failure of this bolt to be in its proper place, secured by its washer, nut and cotter key, was not determined.

Respectfully submitted,

W. J. PATTERSON,

Director.