INTERSTATE COMMERCE COMMISSION WASHINGTON

REPORT OF THE DIRECTOR
BURZAU OF SAFETY

ACCIDENT ON THE NEW YORK CENTRAL RAILROAD

ROCKY RIDGE, OHIO

JULY 31, 1938

INVESTIGATION NO. 2285

SUMMARY

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Railroad:

New York Central

Date:

July 31, 1938

Location:

Rocky Ridge, Ohio

Kind of accident:

Rear-end collision

Trains involved:

Passenger

: passenger

Train numbers:

76

: First 68

Engine numbers:

4917

: 5418

Consist:

9 cars

: 14 cars

Speed:

Standing

: 7-10 m.p.h.

Operation:

Timetable, train orders and automatic

block-signal and automatic train-stop

system.

Track:

Four tracks; tangent; practically level.

Weather:

Rain

Time .

7:06 p.m.; twilight.

Casualties:

1 killed, 55 injured.

Cause:

Failure to operate First 68 in accordance with signal indications and to provide adequate flag protection for

No. 76.

September 9, 1938.

To the Commission:

On July 31, 1938, there was a read-end collision between two passenger trains on the New York Central Railroad near Rocky Ridge, Ohio, which resulted in the death of I passenger and the injury of 23 passengers, 31 dining car employees and I coach porter. The investigation of this accident was made 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 Toledo Division which extends between Toledo and Cleveland, Ohio, a distance of 106.62 miles. In the vicinity of the point of accident this is a 4-track line over which trains are operated by timetable, train orders, and an automatic block-signal and automatic train-stop system. The tracks from north to south are: No. 3, westward freight; No. 1, westward passenger; No. 2, eastward passenger; and No. 4, eastward freight. The accident occurred on track No. 2 at a point 2,706 feet east of the station at Rocky Ridge. Approaching from the west the track is tangent for more than 8 miles to the point of accident and for several miles beyond. The grade is practically level, being 0.04 percent descending for east-bound trains at the point of accident.

The signals involved are automatic signals 62.2 and 61.2 located 6,030 feet and 230 feet, respectively, west of the point of accident. These signals are of the 2-arm, 2 position, lower-quadrant, semaphore type and are approach lighted.

Night aspects and indications of these signals are as follows:

> Green-over-green Green-over-yellow

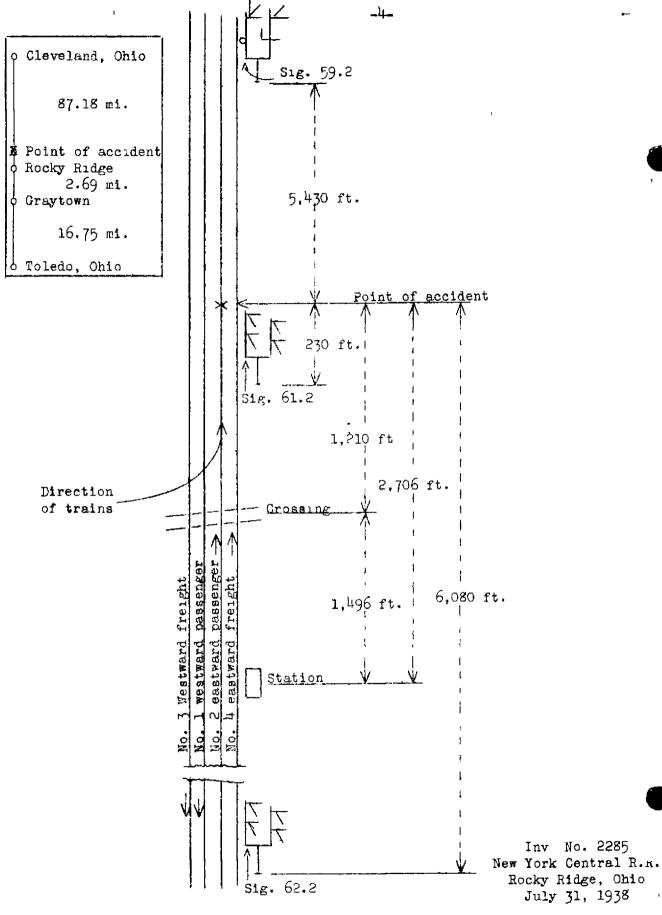
Proceed.

Proceed preparing to stop at next signal; train exceeding medium speed must at once reduce to that speed. Red-over-yellow Stop; then proceed at re-

stricted speed.

Medium speed is defined as, "a speed not exceeding thirty miles per hour". Restricted speed is defined as, "a speed not exceeding that which will enable a train to stop short of train shead, obstruction, or switch not properly lined, end look out for broken reil".

The maximum speed for passenger trains on track No. 2 is 80 miles per hour.



The automatic train-stop system is of the intermittent inductive type, with forestalling device. Rule 6 of the rules for the operation of the automatic train stop reads:

"Enginemen must not forestall until after signal indication has been observed and is being obeyed."

Rule 35, of the operating rules, reads:

"The following signals will be used by flagmen:

Day signals- A red flag, Night signals-A red light, Torpedoes, A white light, Fusees. Torpedoes, Fusees."

Rule 99 reads in part:

"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 recalled and safety to the train will permit, he may return. ***

"When day signals cannot be plainly seen, owing to weather or other conditions, night signals must also be used."

The sunset time on the day and at the point of the accident was approximately 7:22 p.m., according to the United States Weather Bureau. It was raining at the time of the accident, which occurred about 7:06 p.m.

Description

No. 76, known as "The Mercury", an east-bound passenger train, consisted of one combination baggage and smoking car, three coaches, one kitchen car, one dining car, one lounge car, one parlor car, and one club-observation car, in the order named, of all-steel or metal-alloy construction, hauled by engine 4917, and was in charge of Conductor Green and Engineman Bellner. The engine, which was of the 4-6-2 type, was equipped with ET-6 type brake equipment and the cars with UC-12 type brake equipment. This train departed from Toledo, 19.44 miles west of Rocky Ridge, at 6:35 p.m., according to the train sheet, on time, passed Millbury Junction, the last open office, 11.95 miles from Rocky Ridge, at 6:46 p.m., one minute late, and struck an

sutomobile at a highway crossing located 1,496 feet east of the station at Rocky Ridge. The train stopped at a point more than 1 mile beyond the crossing and then backed, stopping with its rear end 1,210 feet east of the crossing and 230 feet east of signal 61.2; while standing at this point it was struck by First 68.

First 68, known as "The Commodore Vanderbilt", an east-bound passenger train, consisted of one bargage car, two Pullman sleeping cars, one lounge car, two Pullman sleeping cars, one dining car, one lounge car, five Pullman sleeping cars, and one dining car, in the order named, all of all-steel construction, hauled by engine 5418, and was in charge of Conductor Lenz and Enginemen Callan. The engine, which was of the 4-6-4 type, was equipped with ET-8 brake equipment and the cars were equipped as follows: 2 UC-12, 1 PC, 1 UC-12, 1 PC, 3 UC-12, 4 D-22-A, and 2 UC-12. This train departed from Toledo at 6:43 p.m., according to the train sheet, on time, passed Millbury Junction at 6:55 p.m., on time, passed signal 62.2 displaying a green-over-yellow aspect, passed signal 61.2 displaying a red-over-yellow aspect, and collided with No. 76 while traveling at a speed estimated to have been between 7 and 10 miles per hour.

No. 76 was shoved shead about 5 feet; the engine became detached and stopped 15 feet from the first car; the rear truck of the rear car was derailed and the car was badly damaged; all of the other cars were more or less damaged. The engine of First 68 was not derailed but the front end was considerably damaged; the draft gears of the seventh and eighth cars were broken; none of the remaining equipment in this train was derailed or damaged.

Summary of evidence

Engineman Bellner, of No. 76, stated that soon after passing Rocky Ridge he saw an automobile proceed upon a highway crossing and stop in the center of track No. 2, following which it backed up and apparently became stalled. The train then struck the front end of the automobile, taking off the front fenders. He made a heavy service application of the air brakes and the train stopped at a point more than 1 mile beyond, just west of signal 59.2. After informing the conductor that the engine had struck an automobile, he was instructed by the conductor to back the train. He backed to within 2 car lengths of signal 61.2, and the conductor signaled him to back farther, but he would not go beyond signal 61.2. this back-up movement, which he thought consumed about 3 or 4 minutes, he was depending upon the protection of the block signal. He released the brakes on the train and applied the independent brake and saw the flagman going back to flag and the

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conductor malking toward the crossing. After the train stood there about a minute or two he saw the headlight of First 68 wast of Rocky Ridge. The fireman, who had left the engine and started back, called a warning when about 4 car lengths from the engine and then the collision occurred. The engineman thought his train had stood there a total of 4 or 5 minutes when the accident occurred. It was twilight and rain was falling, and at times it was difficult to see any great distance; however, he said the visibility was such that he could have stopped at any signal displaying a stop indication.

Firenan Heidt, of No. 76, stated that he had walked back along the right side about three or four car lengths when he saw First 68 approaching, and he thought it was then near Graytown, 2.69 miles from Rocky Ridge. He saw the flagman wave his red flag but could not tell how far back he was. When First 68 passed signal 61.2 he called a warning to his engineman. He said it was raining quite hard just previous to and at the time of the accident.

Head Brakeman Butler, of No. 76, stated that he was in the first car when the train stopped at 6.54 p.m. He went to the engine, was informed by the engineman that they had struck an automobile and he saw that the engine step was bent. He informed the conductor, who was at the middle of the train, of what had occurred. He saked him if they should back and the conductor replied in the affirmative and gave a back-up signal. As they were moving backward Brakemen Butler gaw an automobile pass over the crossing. The train stopped about 7:02 p.m. and he immediately started back to see if there was an automobile in the ditch; th⇒ flagman was proce∈ding ahead of him. Signal 61.2 was in the stop position but he could not see the position of signal 62.2. When he first saw the approaching train, the engine was working steam and he thought it was near signal 62.2. Both he and the flagman tricd to stop it, the flagman waving his red flag and he waving his cap. He thought the engineman answered their signals when near the station. The train passed the crossing at a speed of about 25 miles per hour, and the speed was reduced to about 8 miles per hour at the time of the accident. It was daylight and it was misting at the time but there was nothing to prevent the enginemen of First 68 from seeing either signal 61.2 or the flagman.

Conductor Green, of No. 76, stated that after his train stopped and he had been informed of striking the automobile, he looked tack and could see a distance of two signal blocks and he saw an object on the track at the crossing. He gave a back-up signal and rode at the front end of the eighth car and could see behind his train by looking through the observation

The visibility was good and he considered it safe to make this movement without having a flagman precede the train; the flagman was on the rear end of the rear car during the The conductor saw some one remove an object back-up movement. from the track, which he observed as they neared it to be an automobile and it proceeded over the crossing. As soon as the train stopped the flagman and head brakeman ran back and he took up a position on the ground near the rear of the train, at which time First 68 was not in sight. Looking back from his position on the track he could see that signal 61.2 was in stop position, signal 62.2 was in caution position and he could see the faint outline of the next signal but could not When he saw the headlight of First 68 emerge see its position from a rain storm he watched the flagman who continued going back and he saw him wave his red flag at a point from 10 to 12 telegraph-pole spaces to the rear of his train which he estimated to be a distance of about 500 feet. He realized that the approaching train was not gring to stop when it passed over Main Street crossin, , west of Rocky Ridge, located approximately 3.675 feet west of signal 61.2, at which point the speed was between 55 and 60 miles per hour and the engine was working steam. He turned around to give his engineman a proceed signal, but saw some one on the ground whom he took to be the engineman. He did not see any sparks or fire flying from the brake shoes of First 68, but there appeared to be considerable dust when the train passed over the crossing, and the engineman closed the throttle before the collision occurred. Conductor Green further stated that his train had been standing about 3 minutes before the accident occurred and that the marker lights on his own train were burning.

Flagman Peterson, of No. 76, stated that as soon as his train stopped, following the back-up movement, he and the head brakeman went back as fast as they could to the crossing, looking for the automobile and expecting to find it in the ditch, but it was not there. As they started back the head brakeman stated that he saw a headlight a considerable distance to the rear, but the flagman could not see it, although he could see a distance of 7 or 8 miles; however, he was not concerned about the headlight at that time as they were looking for the automobile. When they reached the crossing, the headlight of First 68 was seen and appeared to be about 13 miles distant. both flagged the train, remaining near the crossing, and the engineman finally ans ered their signals when about 1,500 feet It sounded as though the engine was working steam with the brakes applied; the throttle was closed, however, before passing them. He estimated its speed to have been about 20 miles per hour as it passed them and the senders were open, but the brakes did not appear to be effective. Flagman Peterson further stated that he had fusees with him, but did not think it necessary to light one, as he thought the engineman had sufficient time to stop his train. He also stated that there was no necessity for him to go west of the crossing as his train was headed east; as far as the automobile was concerned they were ready to go, but then First 68 appeared. It had been raining intermittently, but it was not raining at the time he went back to flag.

Engineman Callon, of First 68, stated that an airbrake test was made at Toledo and a running test en route after leaving that point; the brakes functioned properly. On approaching Rocky Ridge a heavy rain was falling and due to the rein blowing in, he had the front window open only about 2 or 3 inches and he was looking anead through the opening, but did not see the yellow indication of signal 62.2 until he was He called its indication and about one-quarter mile from it. remarked to the firemen that a surprise test must be in progress. The speed of the train was about 75 miles per hour; he made an 8-pound brake-pipe reduction, operated the forestalling device of the automatic train-stop system and closed the throttle, passing signal 62.2 at a speed of about 70 miles per hour. He made a further reduction, but as the brakes did not seem to be effective he made a third reduction, making a total reduction of 35 pounds. He saw the red aspect of signal 61.2 when a short distance east of signal 62.2, and was making the reductions to stop at signal 61.2. He then saw the flagman and placed the brake valve in emergency position, answered the flagmen's signals, and then sering No. 76 he opened the sanders, reversed the engine and opened the throttle slightly. He thought the speed had been reduced to 7 or 8 miles per hour at the time of the accident, and it was his opinion that he would have been able to stop his train within a distance of 2 more car lengths. He stated that the reason he did not see the signal indications sooner was due to the rain, but he had passed out of the shower at the point of the accident. He said that had he known No. 76 was standing just east of signal 61.2 at the time he first saw the yellow aspect of signal 62.2, he would have made heavier brake applications and would have been able to stop west of signal 61.2. He thought that if he had not forestalled at signal 62.2 he would have been able to stop short of No. 76 because a full service application of the brakes would have occurred automatically and this application would have been beyond his control.

Fireman Warnes, of First 68, also stated that due to the heavy rain they were unable to see the indication of signal 62.2 until less than one-quarter mile from it. The engineman immediately applied the air brakes, operated the forestalling feature of the automatic train-stop device and they proceeded toward the next signal at a rate of speed which he considered safe, thinking that they had ample time to stop. When approximately one-quarter mile from signal 61.2 he saw the stop indication and the train shead, stating that up to that time he

could not see either the signal or the train due to the rain. He had his front window open about 4 inches. He was unable to say how many brake pipe reductions the engineman made, but the latter applied the brakes in emergency, reversed the engine and opened the throttle slightly. He estimated the speed to have been about 10 miles per hour at the time of the accident. He indicated that if the engineman had not forestalled, the train possibly would have stopped short of No. 76.

Conductor Lenz, of First 68, stated that he was in the diner and his train was traveling at a speed of 65 or 70 miles per hour when he felt a service application of the brakes just west of the station at Rocky Ridge. He thought the train then traveled a distance of about three-fourths mile when the collision occurred, stating that he walked through two cars from the time he felt the first application until he felt a heavier application at the time of the socident, and he did not feel an emergency application.

Head Brakeman Gage, of First 68, stated that he had just stepped out upon the rear platform of the rear car when he felt an application of the air brakes. It was raining and he could not be sure as to their location, but stated that without doubt they were west of signal 62.2 when the application was made. The flagman threw off a fusee in the vicinity of signal 62.2, although the brakeman did not observe the signal when they passed it. The brakes had not been released and the speed was being reduced, but he did not feel another brake application until just before the accident when he felt an emergency application, at which time the speed was about 10 miles per hour.

Flagmen Swanker, of First 68, stated that he was on the rear platform of the train and when about halfway between Graytown and Rocky Ridge, or possibly a little nearer Rocky Ridge he felt an application of the air brakes. After having traveled about 1 mile he felt a second application of the air brakes. Realizing that the train was going to stop, he threw off a lighted fusee which landed near the station. He was of the ominion that the brakes had been released after the first application.

Statements of the two enginemen who operated engine 5418 of First 68 from Chicago to Elkhert and Elkhart to Toledo, were to the effect that the automatic train-stop and sir-brake equipment functioned satisfactorily en route.

Assistant Night Foreman Reeves, at Toledo, stated that on the arrival of both No. 76 and First 68 the air brakes were tested and all air-brake equipment was in good condition and functioned properly.

Observations of Commission's Inspectors

Examination of the speed-recorder tane with which engine 5418 was equipped indicated that a speed of more than 75 miles per hour had been maintained for more than 7 miles to about 2,500 feet west of the point of accident. The tape then indicated a very rapid deceleration at first, denoting a heavy brake application, followed by a precipitous decline, denoting an emergency application; the valve pilot at this point showed a reverse movement of the valve gear.

Air-brake tests were conducted on August 5, 1938, in the vicinity of Rocky Ridge, using a train made up in the same order and with the same type of brake equipment on both the engine and the cars as was on First 68 at the time of the accident. At the time of these tests the weather was clear and the rail dry. The total length of the train, including the engine, was 1,237 feet. A test made at Toledo before its departure showed the piston travel on the four streamlined sleeping cars to vary from 4½ to 5½ inches; on the other cars it varied from 5 to 7½ inches. The tests at signal 62.2 were as follows:

First test

The circuit for the inductor at signal 62.2 was opened for test purposes. The train attained a speed of 76 miles per hour at the inductor and, as intended, a full service automatic brake application was made, with the throttle wide open, and the train stopped in a distance of 5,107 feet, at a point 743 feet west of signal 61.2, and 973 feet west of the point of accident. The throttle was not closed until after train had stopped. The elapsed time was 1 minute 6 seconds.

Second test

The circuit for the inductor at signal 62.2 was obened for test purposes. At a point 1,000 feet west of signal 62.2, when the speed was 76 miles per hour, a 9-pound service reduction was made, and after forestalling at the inductor the throttle was closed and a further reduction of 8 pounds was made, making a total of 17 pounds; and after brake-pipe exhaust ceased, an attempt was made to make a third reduction on passing a white marker, but an emergency application was then made at or almost at the same time. The white marker was located 2,500 feet west of signal 61.2, the location at which the engineman on First 68 stated he first observed the flagman of No. 76 and made the emergency application; the train stopped in 4,594 feet, which was

2,256 feet west of signal 61.2 and 2,486 feet west of the point of accident, and the elapsed time was 1 minute 8 seconds.

Third test

The inductor was restored to normal condition at signal 62.2, and with the train approaching the signal at 82 miles per hour an emergency application was made when the cab of the engine passed the signal, after which the throttle was closed and the train stopped at a point 3,111 feet beyond the signal, which was 2,739 feet west of signal 61.2, and 2,969 feet west of the point of accident, the elapsed time being 43 seconds.

According to surprise-test records, Engineman Callon was given six tests in 1935, three in 1936, two in 1937, and two in 1938, and in all instances his performance was satisfactory. He was last given a vision expoination on July 22, 1938, which indicated that glasses were not necessary.

Relay and signal tests made on August 1, immediately following the accident, and track inductor tests made on February 7, April 27, and July 1, 1938, showed all values within the prescribed limits set by the New York Central System Signal and Train Control Committee.

Discussion

No. 76 was stopped due to striking the front end of an automobile at a grade crossing located 1,496 feet east of the station at Rocky Ridge, the train stopping 6,640 feet beyond the crossing. On instructions from the conductor the train was then backed against the current of traffic to a point 230 feet east of signal 61.2 and 1,210 feet east of the crossing; in making this movement a flagman was not sent back to protect the train, in spite of the fact that the schedule of No. 68 at Millbury Junction, the last point west of the point of accident where time is shown, was only 10 minutes later than that of No. 76. Under the rules when a train stops under circumstances in which it may be overtaken by another train, the flagmen must so back immediately with flagman's signals a sufficient distance to insure full protection, placing two torpedoes, and when necessary, in addition, lighted fusees, and when day signals cannot be plainly seen owing to meather conditions night signals must also be used. Under these circumstances the flagman should have been sent back a sufficient distance to insure full protection before the back-up movement was made, but instead the train backed up immediately with the flagman on it. As soon as it stopped he went back to the crossing expecting to find a demaged automobile but it was not there. He was accompanied by the

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head brakeman and when they reached the crossing they saw the Headlight of First 68 which appeared to be about 1 miles distant. He then waved a red flag but his signals were not answered until the approaching train was about 1,500 feet from him. According to his own statements he could have gone farther west but he stated that there was no necessity for him to go west of the crossing when they were headed east. The fact that the engineman of First 68 did not answer his signals should have indicated to the flagman that the engineman did not see him and should have influenced him to take further action by lighting a fusee While the statements varied as to whether it was raining at the time of the accident and whether visibility was obscured by the rain, showers were occurring intermittently and the sun set about sixteen minutes His own engineman later with the result that it was twilight. stated that at times it was difficult to see any great distance, and the engine crew of First 68 stated that their view shead was restricted by the rain. Under such conditions, there is no doubt that a lighted fused would have been seen at a greater distance than a red flag. According to the evidence the headlight on First 68 and the markers on No. 76 were burning which indicates that certain members of both crews recognized the fact that weather conditions warranted the use of night sighals, but the flagman of No. 76 did not take a red lantern and a white lantera with him, which was required under the provisions of rule 35. Had the flagman used a red lantern instead of a red flag in flagging First 68, it is probable that the engineman would have seen the hand signals earlier, which would have given him a greater distance in which to stop his train.

According to the engineman of First 68, he was operating his train at a speed of about 75 miles per hour when he sew the green-over-yellow aspect at signal 62.2, but he did not at once reduce the speed to not in excess of 30 miles per hour as required by that signal indication; he made an 8-pound brakepipe reduction when he saw the signal, operated the forestalling feature of the automatic train-stop device and closed the throttle, passing that signal at a speed of about 70 miles per hour. He then made further reductions, making a total of 25 pounds, and when he saw the flagman he placed the brake valve in emergency position, opened the sanders, reversed the engine and opened the throttle slightly. The speed-recorder tape with which engine 5418 was equipped, however, indicates that a speed of 75 miles per hour was maintained to a point approximately 2,500 feet from the point of accident. The tape then indicated a very rapid rate of deceleration, denoting a heavy brake application, followed by a precipitous decline, denoting an emergency application, and the valve pilot at this point shows a reverse movement of the valve gear. Due to the small scale of

the recorder tape, which is one-half inch to I mile, the distance can be only approximated. However, the record of the speed-recorder tape is corroborated by employees on both trains involved; according to the conductor and flagman of No. 76 the engine of First 68 was working steam and it was running at high speed as it closely approached their train, and the conductor and head brakeman of First 68 felt a service application of the brakes when approaching the point of accident, followed shortly by a heavier application at or about the time of the collision.

After the accident three brake tests were conducted at Rocky Ridge, using similar make-up of train with the same type of air-brake equipment as was employed in First 68. one test with the train traveling at 76 miles per hour the brakes were allowed to apply in service automatically at the automatic train-stop inductor at signal 62.2, and the train stopped in a distance of 5,107 feet, which was 973 feet west of the point of accident. In another test, with the train traveling at a speed of 82 miles per hour an emergency application was made by means of the engineman's brake valve when the engine cab passed the signal, and the throttle was closed; the train stopped in 3,111 feet, which was 2,969 feet west of the point of accident. A test was also conducted in an attempt to duplicate the brake-pipe reductions on the night of the accident, as stated by the engineman. At a point acproximately 1,000 feet west of the signal, a 9-pound service reduction was made, and after forestalling at the inductor the throttle was closed and a further reduction of 8 pounds was made; and after the brake pipe exhaust ceased a third service reduction was started, followed immediately by an emergency application, the train being stopped 4,594 feet from the point where the first reduction was made, which was 2,486 feet west of the point of accident. It was raining at the time of the accident but the tests were conducted during dry weather; however, these tests show conclusively that had the engineman made the service reductions and emergency application as stated by him, his train would have stopped short of signal 61.2. tests demonstrated that had the engineman not operated the forestalling device of the automatic train-stop system, thereby allowing the brakes to be applied automatically at signal 62.2, or had the engineman himself properly operated the train brake equipment, the automatic train-stop brake application being forestalled, the speed of this train could have been controlled as required by the signal indications which were displayed, and the train could have been stopped in time to avoid overrunning the stop signal and to avert the accident.

In previous accident investigation reports attention has been called to the failure of enginemen properly to control

the speed of their trains after operating automatic train stop forestalling devices. The rules of the New York Central Reilroad specifically require that enginemen must not forestell an automatic brake application until after a restrictive signal indication has been observed and is being obeyed. In the reports covering the accidents which occurred at Crugers, N. Y., on August 31, 1934, and at North Germantown, N. Y., on April 17, 1938, the attention of officers of the New York Central Railroad was directed to the dangerous practice of running on yellow signals without reducing speed as required by the rules, and it was stated that consideration should be given the question whether forestelling devices should be continued as a part of the automatic train-stop system. If supervising officers cannot enforce compliance with the rules for the control of speed and the operation of the automatic train-stop devices, in the interest of sefety serious consideration should be given to such modification of the automatic train-stop devices as will insure that the speed of trains will be automatically controlled in conformity with restrictive signal indications.

Conclusion

This accident was caused by failure to operate First 68 in accordance with signal indications and by failure to provide adequate flar protection for No. 76.

Recommendation

It is recommended that responsible officials of the New York Central Railroad give consideration to further means of insuring that the speed of trains operating under restrictive signal indications will be properly controlled.

Respectfully submitted,

W. J. PATTERSON

Director.

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