INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN ACCIDENT ON THE NEW YORK CENTRAL RAILROAD AT CRUGERS, N.Y., ON AUGUST 31, 1934.

October 19, 1934.

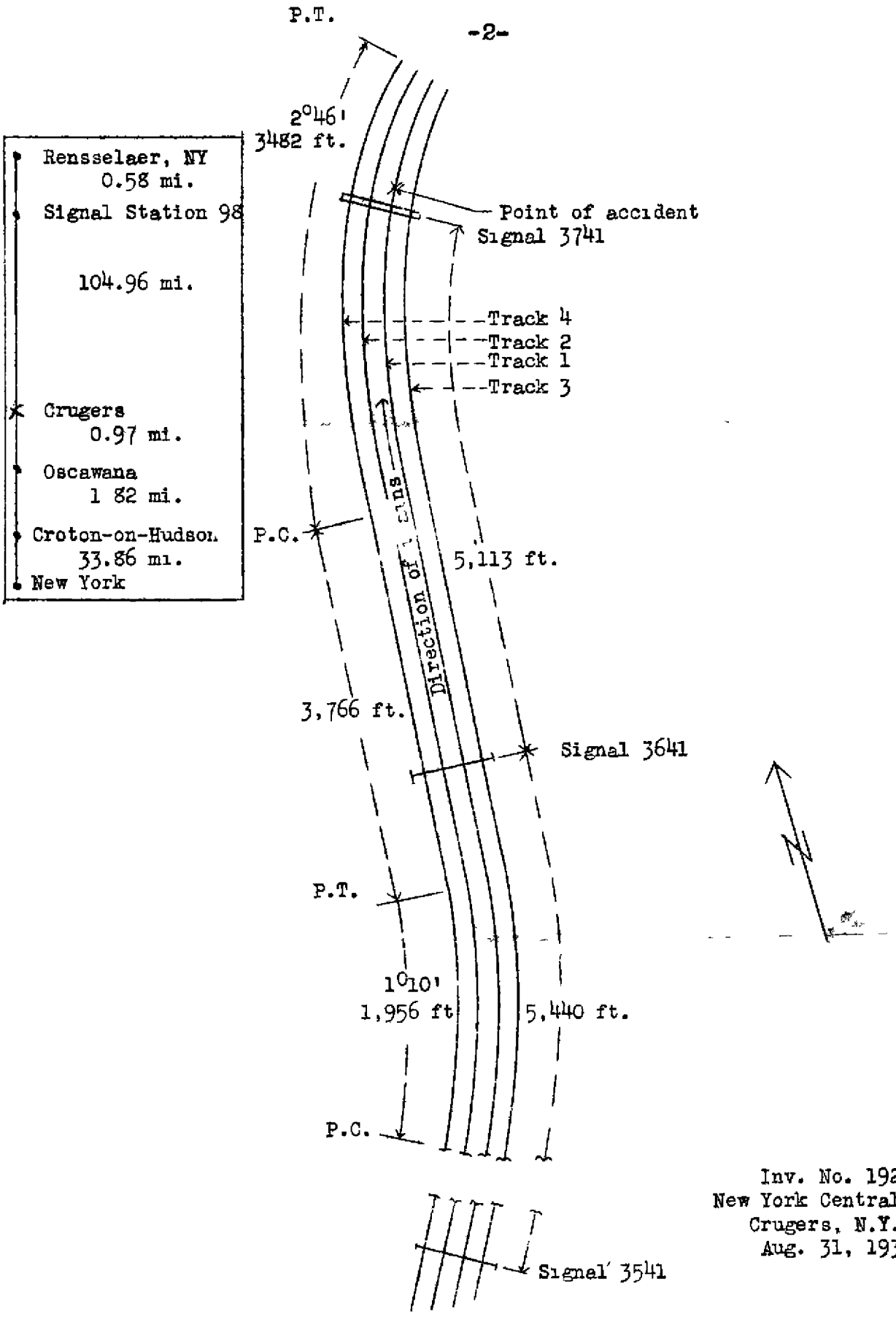
To the Commission:

On August 31, 1934, there was a rear-end collision between two passenger trains on the New York Central Railroad at Crugers, N.Y., which resulted in the death of 1 employee and the injury of 295 passengers, the majority of whom sustained only minor injuries. The investigation of this accident was held in conjunction with a representative of the New York Public Service Commission.

Location and method of operation

This accident occurred on that part of the Hudson Division extending between Croton-on-Hudson and Signal Station 98, located 0.58 mile east of Rensselaer, N.Y., a distance of 107.17 miles, in the vicinity of the point of accident this is a 4-track line over which trains are operated by time table, train orders, and an automatic block-signal and train-stop system, the latter being of the intermittent-induction type. The general direction of the tracks is north and south, but time-table directions are east and west and the latter directions are used in this report. The tracks are numbered, from south to north, 4, 2, 1 and 3, and the accident occurred on track 1 at a point approximately 50 feet west of the station at Crugers. Approaching this point from the east, there is a 1° 10' curve to the left 1,956 feet in length and then the track is tangent for a distance of 3,766 feet, followed by a 2° 46' curve to the right 3,182 feet in length, the accident occurring on this latter curve at a point 2,787 feet from its eastern end. The grade at the point of accident is 0.26 percent ascending for west-bound trains.

The automatic signals involved are signals 3541, 3641 and 3741, located 10,705 feet, 5,265 feet and 152 feet, respectively, east of the point of accident. The first two signals are mounted on signal bridges and are of the 3-arm, 3-position, upper-quadrant type, while signal 3741 is mounted on a highway bridge and is of the color-light type, night indications of these signals are green, yellow and red, for proceed, proceed at reduced speed prepared to stop at next signal, and stop and then proceed, respectively. From trains approaching from the east the view of signals 3541 and 3641 is unobstructed, but on account of the track passing through a sloping 40-foot cut the



Inv. No. 1928
New York Central R.R.
Crugers, N.Y.,
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view of signal 3741 is restricted to about 800 feet. The maximum authorized speed for the trains involved is 65 miles per hour.

The weather was clear at the time of the accident, which occurred about 10:40 p.m.

Description

West-bound passenger Train Fourth No. 29 consisted of 1 Pullman club car and 11 Pullman sleeping cars, all of steel construction, hauled by engine 5309, and was in charge of Conductor Ziegler and Engineman Crum. This train left Croton-on-Hudson, 2.79 miles east of Crugers, at 10:29 p.m., 14 minutes late, after having crossed over from track 3 to track 1 at that point, passed signal 3641 under a yellow indication, passed signal 3641 under a green indication and passed signal 3741 under a yellow indication; the engineman failed to operate the forestalling device of the train-stop system when passing signal 3741, resulting in an automatic application of the air brakes, the train stopping with its rear end about 152 feet beyond the signal. As soon as the brakes were released the train started, and it was moving at a low rate of speed when the rear end was struck by Train First No. 71.

West-bound passenger Train First No. 71 consisted of 1 baggage car, 1 refrigerator car, 1 baggage car, 3 coaches and 4 Pullman sleeping cars, all of steel construction except the refrigerator car which was of steel-underframe construction, hauled by engine 5351, and was in charge of Conductor Stapleton and Engineman Cummings. This train passed Croton-on-Hudson at 10:35 p.m., 6 minutes late, passed signals 3641 and 3641 displaying yellow indications, passed signal 3741 displaying a red indication, and shortly afterwards collided with Train Fourth No. 29 while traveling at a speed of about 23 miles per hour, according to the speed recorder with which the engine was equipped.

As a result of the collision the rear end of the tender of engine 5309 and all of the cars in Train Fourth No. 29 were more or less damaged, the rear truck of the last car being derailed. The driving wheels of engine 5351 also were derailed and the engine was badly damaged, and the first two cars in Train First No. 71 were slightly damaged. The employee killed was the head brakeman of Train Fourth No. 29.

Summary of evidence

Engineman Crum, of Train Fourth No. 29, stated that his train left Harmon on the Electric Division, on track 3 under a yellow signal indication and stopped at Croton-on-Hudson for a red signal.

Upon receiving a yellow signal indication the train entered track 1 and proceeded to signal 3541 at a speed of about 20 miles per hour. This signal also was displaying a yellow indication, but signal 3641 was displaying a green indication and the train passed it at a speed of about 35 miles per hour. While approaching signal 3741 he observed that it was yellow and closed the throttle but neglected to operate the forestalling device, resulting in the brakes being applied and stopping the train. The fireman then got off and operated the reset button of the automatic train-stop system, and after taking the slack twice the train was started, but moved a distance of only about one-half car length when the brakes were applied in emergency and the train stopped; Engineman Crum did not know at that time that a collision had occurred as Train Second No. 71 was passing his own train on track 3. He estimated that his train had been standing about 2 minutes before it started ahead and said that he did not whistle for flag protection until the train stopped the second time.

Conductor Ziegler, of Train Fourth No. 29, stated that he did not notice anything unusual about the operation of the train until there was a heavy brake application, stopping the train a short distance west of Crugers station. He was in the seventh car and as soon as the brakes were applied he arose from his seat, put on his coat and hat, and had reached the door when the crash occurred. He did not know whether his train was moving at the time of the accident, and was unable to estimate how long it had been standing before the accident occurred.

Rear Brakeman Shayne, of Train Fourth No. 29, stated that he rode on the rear platform of the train from Croton-on-Hudson and while the train was stopping at Crugers he threw off a lighted fusee, which was about 25 feet from the rear end when the train stopped; he then went back and placed two torpedoes east of the fusee. An east-bound freight train was passing on track 4, Train Second No. 71 was approaching on track 3, and a few seconds later he saw the headlight of Train First No. 71 approaching on track 1, and in order to avoid being struck he jumped over the inter-track fence located between tracks 1 and 2, and then gave stop signals with a lantern while running on track 2 towards the approaching train; he said he had reached a point approximately 10 or 15 feet east of signal 3741 before Train First No. 71 passed him, traveling at a speed of about 15 miles per hour. The fusee was still burning when the engine passed over it, but none of his warning signals were acknowledged by the approaching train.

Engineman Cummings, of Train First No. 71, stated that the automatic train-stop device was tested at Harmon, 1.18 miles east of Croton-on-Hudson, and functioned properly, that his train left on a yellow signal indication, and that a running test

of the brakes was made after leaving that point, while speed was reduced at Croton-on-Hudson for another yellow signal. He then worked steam, but signals 3541 and 3641 also were displaying yellow indications, and he closed the throttle about the time he passed the latter signal, made a slight brake-pipe reduction before reaching the curve on which signal 3741 is located, and then moved the brake-valve handle to lap position. Due to a freight train moving eastward on track 4 and Train Second No. 71 passing him west-bound on track 3, the view of signal 3741 was obscured by smoke and steam and the first he knew of anything wrong was when he saw the rear end of the train ahead, before passing over the automatic train-stop inductor located 70 feet in rear of the signal, and then he saw the signal at stop; he applied the brakes in emergency immediately, without having released the previous brake application. He did not see the flagman of Train Fourth No. 29 but heard torpedoes explode and saw a fusee, which was still burning under his engine after it stopped. Engineman Cummings estimated the speed of his train at the time of passing Croton-on-Hudson to have been about 55 miles per hour, and said it was 35 or 38 miles per hour when he shut off, about 35 miles per hour when the first application of the brakes was made, and between 20 and 25 miles per hour when he applied the brakes in emergency, the latter application having little effect on account of the short distance to the point of accident. He said that he was familiar with the location of signal 3741 and had been instructed on several occasions about compliance with the rules, with particular regard to the observance of signal indications, but that he had been running on the yellow and expected to find a yellow signal at signal 3741, and when he could not locate the signal he was about to apply the brakes just as he saw the rear end of the train ahead. He said he had operated trains in a somewhat similar manner on previous occasions, but never when an official was riding with him.

Fireman Colbert, of Train First No. 71, stated that the brakes worked properly when the running test was made after leaving Harmon; he called the yellow signal indications en route, and the engineman repeated them and operated the forestalling device of the automatic train stop, which functioned properly. The fireman also practically corroborated the engineman's statements concerning the speed of the train but was not sure as to where the brakes were first applied between signals 3641 and 3741. He thought the speed was a little high, but at the same time thought the engineman was going to slow down and stop at signal 3741. From his position on the outside of the curve it was impossible for the fireman to see signal 3741 and he did not see the fusee, although he saw the flagman on track 2 a short distance west of the signal, swinging a red lantern, and he also heard the explosion of torpedoes just before the accident

occurred.

Conductor Stapleton, of Train First No. 71, stated that he was working through the train and did not pay particular attention to the speed, except that he thought the train was being operated slower than usual in that locality, estimating the speed to have been 25 miles per hour. He felt no brake application after passing Croton-on-Hudson until the brakes were applied in emergency prior to the accident. After the accident the engineman told him that he had been running on yellow signals, but that smoke from Train Second No. 71 obstructed the view and he did not see the home signal until after he saw the rear end of the train ahead. Conductor Stapleton stated that he was the regular conductor and Engineman Cummings was the regular engineman on Train No. 71, and that he had never noticed any inclination on the engineman's part to exceed speed restrictions. Flagman Arnold agreed with Conductor Stapleton that there was an emergency application of the brakes prior to the accident, while Baggageman Fleischmann and Head Brakeman Sweeney did not notice any such application. Both the flagman and the head brakeman, however, said speed was reduced after passing Oscawana.

Engineman Haslin, of Train Second No. 71, stated that the rear end of Train First No. 71 was approximately 10 car lengths ahead of his train at Croton-on-Hudson and he passed the engine of that train when about 7 or 8 car lengths east of signal 3741 while traveling at a speed of about 50 miles per hour. He was running on clear signal indications and could see the signal at Crugers for a distance of about 8 or 10 car lengths. His engine was not making heavy smoke as the train consisted of only seven cars and the fireman had not put in a fire after passing through the tunnel, and there was no smoke in the vicinity that obscured his vision. The signal for track 1 displayed a red indication, and a burning fusee was just west of the signal, but he did not remember seeing a flagman. While passing Train Fourth No. 29 he felt a jar and stopped his train by a service application of the brakes about 12 or 15 car lengths beyond Train Fourth No. 29.

Fireman Hendricks, of Train Second No. 71, stated that his train was traveling about 50 miles per hour when it passed Train First No. 71 west of Oscawana and at that time fire was flying from the brake shoes of that train, indicating that the brakes were applied. He had not put in a fire after passing Oscawana and there was no excessive smoke from his engine. The signal at Crugers for his train on track 3 was green, the signal for track 1 was red, there was a burning fusee on track 1 at least four or five car lengths east of the rear end of Train Fourth No. 29, and the marker lights on that train were burning.

Signalman McDermott was driving home in his automobile and was near Crugers when he saw a west-bound train stop at that point. Knowing that traffic was heavy and thinking he might be of some assistance he drove to the station and saw the train standing on track 1, with a burning fusee about 10 feet east of the train and a flagman with a lantern about 20 feet back of the fusee. Another train was approaching on track 3 and as soon as it passed, his attention was attracted by a third train approaching on track 1; he heard the air brakes apply in emergency when it was about two car lengths from the rear end of the standing train. He did not look at his watch, but estimated that about 3 minutes elapsed from the time the first train stopped until the following train or track 1 collided with it. He said the weather was clear, but after the train on track 3 passed it was hazy in that vicinity.

Tests of signals 3641 and 3741, the signal circuits, and the automatic train stop apparatus showed that the relays, signal mechanisms and inductors were operating as intended and within the operating requirements. The automatic train-stop equipment of each engine also was tested after the accident and found to be in proper operating condition.

The speed recorder tape on engine 5309, of Train Fourth No. 29, indicated that the speed was about 30 miles per hour passing signal 3541, 35 miles per hour at signal 3641, and about 38 miles per hour just before the train reached signal 3741. The tape of engine 5361, of Train First No. 71, indicated that speed gradually increased from Harmon to about 45 miles per hour at a point three-fourth mile west of signal 3541, was about 43 miles per hour at signal 3641, about 33 miles per hour one-half mile east of signal 3741, and about 23 miles per hour where the accident occurred.

Conclusions

This accident was caused by the failure of Engineman Cummings, of Train First No. 71, properly to obey signal indications.

Under the rules, when an approach-signal indication is displayed, trains are required to "proceed at a speed reduced to not exceeding one-half the maximum authorized at point involved (not exceeding 30 miles per hour) prepared to stop at the next signal". They also provide that enginemen of trains running with the current of traffic must forestall when passing over inductors at signals other than clear or clear-restricting signals, but only after the indications have been observed and are being obeyed. Signal 3741 was displaying an approach indication and Engineman Crum, of Train Fourth No. 29, should have reduced speed and forestalled while passing over the

inductor east of this signal. The speed-recorder tape showed that his train was moving at reduced speed as it approached signal 3741, but he failed to forestall, with the result that the automatic train-stop system functioned and caused an automatic application of the brakes, stopping the train with its rear end just beyond the signal. Train First No. 71 was closely following Train Fourth No. 29, and according to the statements of Engineman Cummings he had been running on yellow signal indications for several miles and expected to find a yellow indication at signal 3741. He had some difficulty in locating the signal, however, due possibly to smoke and steam from a freight train and also from Train Second No. 71, which had just overtaken and passed his own train on track 3, and he said he was about to apply the brakes when he saw the rear end of the train ahead, and then saw the signal at stop, too late to avert the accident. The speed-recorder tape showed that Engineman Cummings' train had been traveling at a speed of about 45 miles per hour after passing signal 3541, 43 miles per hour at signal 3641, and about 38 miles per hour when one-half mile from signal 3741. Under the rules governing his movements under an approach signal, however, the speed of his train should not have exceeded 30 miles an hour at any of these points, and in addition Engineman Cummings should have been prepared to stop at each succeeding signal location.

The rear brakeman of Train Fourth No. 29 said he threw off a fusee just before his train stopped and that afterwards he went back and placed two torpedoes on the track just east of the fusee, and when he saw Train First No. 71 approaching he jumped over the inter-track fence in order to avoid being run down and then gave stop signals with a lantern from his position on track 2 just east of signal 3741. There was corroborative evidence that the flagman was on the ground, and also that torpedoes and a fusee were used, but they were too close to the rear of the standing train to provide adequate protection because of the limited view had by the engineman of the following train and the rate of speed at which that train was being operated.

Two very important points are involved in this accident; one is the matter of strict observance of the rules particularly the practice known as "running on the yellow", and the other is the use of the forestalling feature of the automatic train-stop device. Engineman Cummings had been running on yellow indications for a distance of about 4 miles, operating the forestalling lever at the various signal locations, and he expected to receive another yellow indication at signal 3741. This, in substance, was the underlying factor leading to his failure to obey the signal indication which he unexpectedly found in the stop

position. Strict observance of the rules, which in this case would have involved reducing speed to a maximum of 30 miles per hour and approaching the next signal prepared to stop, would have enabled Engineman Cummings to stop his train in time to avoid the accident. Obedience to the rules in most cases would result eventually in the signals clearing up ahead of the train, whereas when running on the yellow an engineman may allow the speed of his train to exceed the maximum authorized speed on the theory that the preceding train will keep moving, and then when the preceding train makes an unexpected stop the following engineman finds himself unprepared for the situation which confronts him. In this respect this accident is very similar to the one which occurred on the Cleveland, Cincinnati, Chicago & St. Louis Railway at Danville, Ind., on April 7, 1933; in that case also there was an automatic stop device in use in connection with the automatic block signals and the train sheet showed that the engineman of the following train had operated his train a distance of 18.7 miles at an average speed of 66 miles per hour although the last 7.5 miles had been under yellow indications. Running on the yellow without reducing speed as required by rule is a dangerous practice and supervising officials should give close attention to this feature of train operation and take such steps as may be necessary to insure that it is discontinued.

Failure properly to control speed after operating the forestalling device has resulted in several accidents in automatic train stop territory and most roads, including the New York Central, now have in effect a rule that an engineman must not forestall an automatic brake application until after the restrictive signal indication has been observed and is being obeyed. That rule was not being obeyed in this case, and the continued occurrence of accidents of this character indicates that there is need for improvement in the enforcement of this rule if forestalling devices are to be continued in use. Attention was called to this matter very definitely in the report covering the accident on the Chicago, St.Paul, Minneapolis & Omaha Railway at Camp Douglas, Wis., on February 28, 1931, wherein the following statement was made:

> By the order of June 13, 1922, prescribing specifications and requirements for automatic train-stop devices, it was required that the device bring the train to a stop, after which the engineman could restore the apparatus to normal condition and the train be permitted to proceed. At the solicitation of the carriers,

> however, this requirement was modified by the order of July 18, 1924, by permitting the use of a forestalling device by means of which the engineman could forestall an automatic application of the air brakes and then "control his train in the usual manner in accordance with hand signals or under limits fixed by train order or prescribed by the operating rules of the company". The use of a forestalling device is not required, and the statement was made in the concurring opinion in the proceeding upon which the order of July 18, 1924, was based, that "If experience shows that the permissive feature does not fulfill its purpose we can at any time require its elimination".

The functions of the forestalling lever are closely allied with proper observance of signal indications, and when an engineman forestalls without having reduced speed in accordance with signal indications such action affords opportunity for the occurrence of an accident of the very type which an automatic train stop is intended to prevent. Too much emphasis can not be laid on the necessity for strict obedience to signal indications; if supervising officials are unable to accomplish this result further consideration should be given the question as to whether forestalling devices shall be continued as a part of an automatic train stop system.

Respectfully submitted,

W. J. PATTERSON,

Director.