

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE
INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE
BALTIMORE & OHIO RAILROAD AT BERWYN, MD., ON JULY 21, 1931.

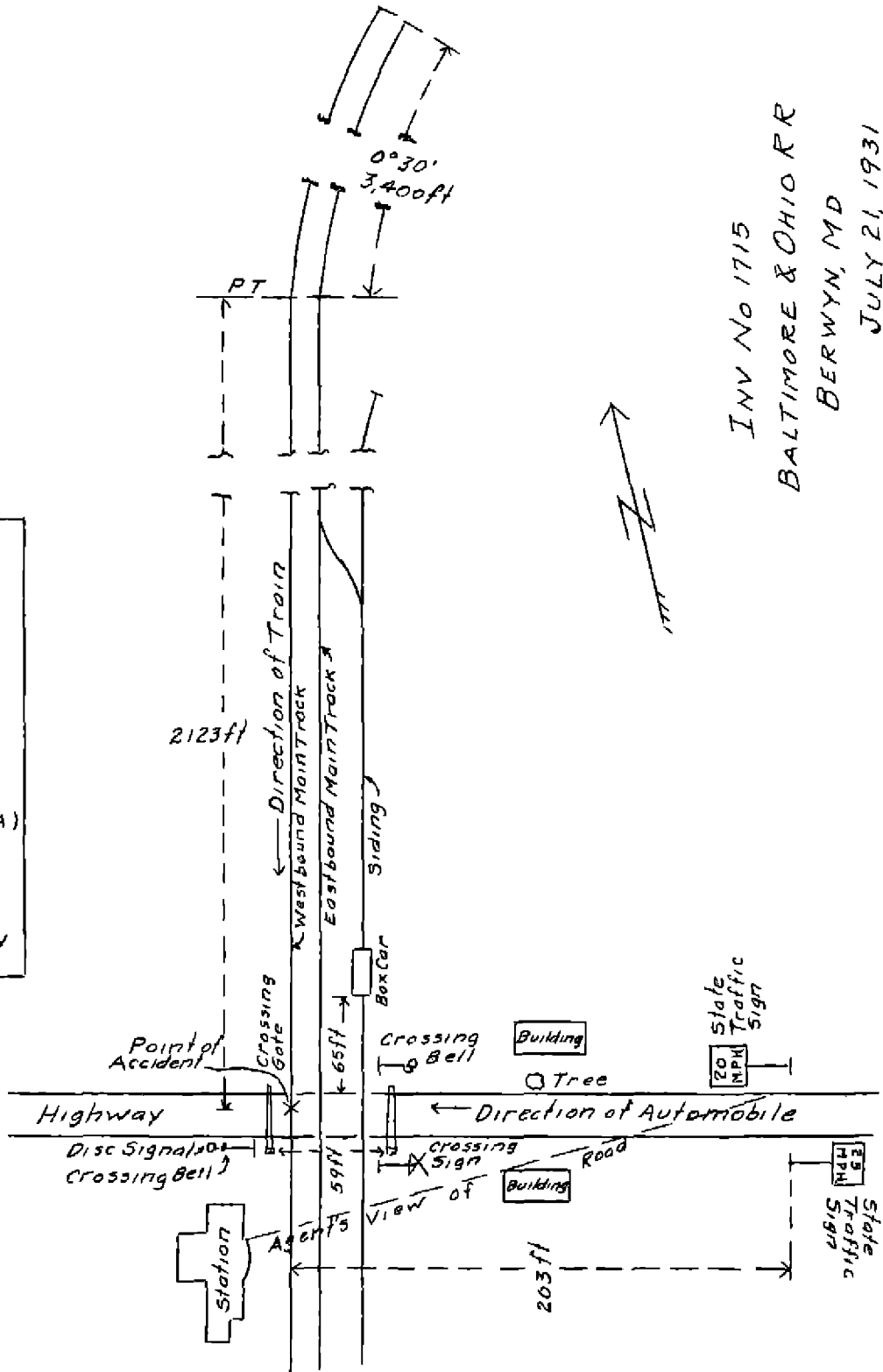
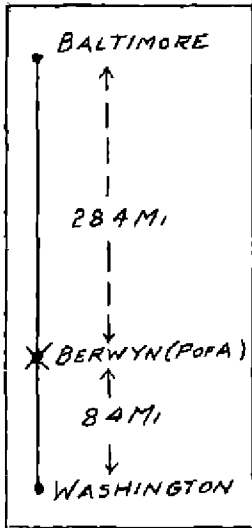
July 31, 1931

To the Commission:

On July 21, 1931, there was a collision between a passenger train and an automobile at a highway grade crossing on the Baltimore & Ohio Railroad at Berwyn, Md., which resulted in the death of two employees and the injury of one employee.

Location and method of operation

This accident occurred on that part of the Baltimore Division extending between Camden Station, Baltimore, Md., and Washington, D.C., a distance of 36.8 miles. In the vicinity of the point of accident this is a double-track line over which trains are operated by time-table, train orders, an automatic block-signal system, and an automatic train-stop system of the intermittent inductive type. The point of accident was where a public highway crosses the tracks at the station at Berwyn, this highway being known as Central Avenue on one side of the tracks and Waugh Avenue on the opposite side. The railroad tracks at the point of accident run practically north and south, referring to compass directions, but time-table directions are east and west, and these latter directions are used in this report. Approaching the point of accident on the railroad from the east, there is a 30' curve to the left 3,400 feet in length, followed by tangent track extending 2,123 feet to the crossing and then for some distance beyond that point. The grade for westbound trains is descending between the curve and the point of accident; it is 0.39 per cent at the leaving end of the curve, and then tapers until at the point of accident it is only 0.09 per cent. In addition to the two main tracks, there is a siding at this point located on the south side of the main tracks and spaced approximately 18 feet from the center of the eastbound main track. Consequently, the driver of an automobile northbound on the highway encounters first the siding, then the eastbound track, and then the westbound track, on which latter track the accident occurred. At the time of the accident there was a box car standing on the siding east of the crossing 65 feet from the highway.



INV No 1715
BALTIMORE & OHIO RR
BERWYN, MD
JULY 21, 1931

The highway involved in this accident crosses the tracks at right angles and has a concrete surface 16 feet in width. Approaching the crossing on the highway from the south, the highway is tangent for a distance of approximately 800 feet, this tangent continuing for a short distance beyond the crossing. The grade of the highway is slightly descending toward the crossing when approaching from the south. At a point about 203 feet south of the center of the westbound track there is a state traffic sign restricting the speed of vehicles to 20 miles per hour. The crossing itself is protected by gates located on either side, by warning bells, one of which is also located on each side, by a cross-bar sign on the south side of the tracks and the west side of the highway bearing the words "Railroad Crossing" on the crossed bars, and in addition there is an enclosed-disk type of signal so arranged that a red disk is alternately exposed to view and then withdrawn, giving it somewhat the appearance of a wigwag signal; this disk signal is located on the north side of the tracks and the west side of the highway. The disk signal and the crossing bells are connected with the track circuits and are so arranged that when an approaching westbound train reaches a point 5,396 feet from the crossing, both bells and disk signal commence to operate and they continue to do so until the rear end of the train has passed the crossing. There is also an annunciator or ticker in the agent's office in the station which begins to sound as soon as the train reaches the circuit above mentioned, the purpose of this latter arrangement being to warn the agent that a train is coming, thus giving him opportunity to lower the gates. The gates are raised and lowered by means of compressed air, and it is necessary for the agent to pump the gates down and also to pump them back to normal position after a train has passed. The mechanism controlling these gates is so arranged that either gate may be raised or lowered independently of the other gate. An interval of from six to seven seconds elapses between the time when the gates begin to move and the time when they are fully lowered; the south gate, however, frequently lags behind the north gate by an interval of about one second. When a northbound automobile is approximately 50 feet from the crossing there is practically an unobstructed view looking toward an approaching westbound train, the box car which was standing on the siding not interfering with this view until the automobile was very close to the tracks.

The weather was clear at the time of the accident, which occurred about 2.02 p.m.

Description

Westbound passenger train No. 523 consisted of 1 baggage car, 1 combination baggage car and coach, 2 coaches, 1 dining car, 2 parlor cars, and 1 lounge car, all of steel construction, hauled by engine 5312, and was in charge of Conductor Kenney and Engineman Ward. This train left Laurel, Md., 9 miles east of Berwyn, at 1.52 p.m., according to the train crew, on time, and was approaching the station at Berwyn, still on time, when it collided with an automobile on the crossing at that point while traveling at a speed shown by the speed recorder on the engine to have been about 55 miles per hour.

The automobile involved in this accident was a Graham sedan, 1931 model, driven by Miss Ethel Thomas, of Washington, D.C., and was proceeding northward on Waugh Avenue. It was driven upon the crossing and brought to a stop directly across the westbound track close to the gate on the north side, which was then down, and it was standing at this point when struck by train No. 523.

The automobile was demolished, the wreckage being carried on the pilot of the engine to the point where the train came to a stop, with the head end of the engine 1,656 feet west of the center line of the crossing. The gasoline tank of the automobile either exploded or was broken by the impact, resulting in blazing gasoline entering the cab, setting fire to some of the cab fixtures, and apparently causing two of the employees who were on the engine to jump in an endeavor to escape the flames. Only slight damage was sustained by the engine and none of the equipment was derailed. The employees killed were the engineman and a fireman who was making the trip in order to learn the operation of the stoker and also to become acquainted with Washington terminal territory; the employee injured was the fireman, who remained on the engine until it came to a stop and was badly burned by the blazing gasoline.

Summary of evidence

Conductor Kenney, of train No. 523, said he was riding in the next to the last car and heard a road crossing whistle signal sounded as his train was rounding the curve east of the point of accident, traveling at a speed of about 70 miles per hour, and this signal was followed by a succession of short blasts on the whistle, this being the conductor's first intimation that there was anything wrong. He estimated that the engine must have been about 1,200 or 1,400 feet east of the crossing when the brakes were applied, but could not say

definitely whether the application was an emergency application or a heavy service application. The air brakes on his train had worked properly at the time running tests were made when leaving Philadelphia and also Baltimore, and that they had worked properly at all other points en route, including the stop made at Laurel 10 minutes prior to the occurrence of the accident.

Baggagemaster Handy, who was in the combination car as the train approached the point of accident, said the road crossing whistle signal was sounded when the head end of the train was, roughly, about 20 passenger-car lengths from the crossing, and that the brakes were applied in a hard service application when about 10 or 12 passenger-car lengths from the crossing; he did not, however, hear any subsequent blasts on the whistle. As the train passed the crossing the car in which he was riding seemed to pass through a wall of flame, which appeared to extend upward as high as the tops of the cars.

Flagman Bramble said his train was traveling at a speed of 55 or 60 miles per hour when he heard the road-crossing whistle sounded, followed by an application of the brakes which he thought was made when the train was 1,100 or 1,200 feet from the crossing. Flagman Bramble did not notice any whistle signals subsequent to the regular road crossing whistle signal.

Engineman Owens, who was deadheading on train No. 523, said he was in the baggage car when he heard the engineman sound the whistle and then hold it down, but he did not think the brakes were applied until an emergency application was made about 50 feet from the crossing. Flames seemed to come in through the baggage-car door. After the train had stopped Engineman Owens went to the engine and found the fireman standing on the deck of the engine, with the cab curtains, whistle cord, and both seat boxes on fire. Engineman Owens boarded the engine, put out the fire, and noticed that the brake valve at that time was in the running position, that the brake-pipe pressure was pumped up to the full pressure of 110 pounds, and that the left injector was working. After the accident, Engineman Owens operated the engine on the movement into Washington, and he stated that the brakes worked properly and that there was no difficulty in the operation of the train.

Fireman Lundy, the regular fireman of train No. 523, was not in condition to be interviewed at length in the hospital, owing to burns received from the blazing gasoline. He stated in substance that the fireman who was killed was on the seatbox on the left side of

the engine and that he himself was also on that side of the engine beside the other fireman. After coming around the curve the engineman whistled for the crossing at Berwyn. Fireman Lundy saw the automobile on the crossing and said something to the effect that they were going to strike the automobile. He also said that the engineman applied the air brakes in emergency and then continued sounding the whistle, but he was unable to say just how far the train was from the crossing when the brakes were applied. It further appeared in conversation with Fireman Lundy that he was knocked down in the course of the rush of those in the engine cab to escape from the blazing gasoline, and he said that had it not been for this fact, he also would have jumped from the engine.

Agent Lorentz, who was on duty at the station at Berwyn at the time of the accident, said that when the annunciator or ticker started to operate, warning him of the approach of train No. 523 he looked toward the south on the highway, in which direction he can see a northbound automobile when 200 feet from the westbound main track, did not see anything approaching, looked to the left or north where his view is considerably restricted, to ascertain if a southbound automobile was in sight, and then began to operate the hand pump for the purpose of lowering the gates. As he was doing so he glanced back toward the south and saw the automobile approaching the crossing at a speed of 20 or 25 miles per hour, and he fixed the location of the automobile at that time as being at or south of a tree which is located about 114 feet from the center line of the westbound track. At this time both gates had started down, and he thought the driver of the automobile was applying the brakes; although he said she had every opportunity to stop, she did not do so but came on toward the crossing, passed under the south gate, which nearly grazed the top of the automobile, and then stopped on the crossing, against the north gate, which was entirely down when she reached it; at that time the train was not in sight. Agent Lorentz said he then threw the valve governing the north gate and tried to pump it up enough to allow the automobile to get off the crossing, but he was unable to do so because of the fact that the automobile was against the gate. He then ran out and tried to push up the gate by hand, but again was unable to do so, and then with the assistance of some others who were in the vicinity at the time, he tried to push the automobile off the track, but the combined efforts of several men were insufficient to move it. The motor apparently had been chocked and although the driver seemed to be doing everything possible to get it started her efforts were unsuccessful. After finding that the machine could not be moved from the tracks, the driver was told to get out, and it was just after she had done so that the

train struck the automobile. Agent Lorentz further stated that the crossing bells, disk signal and gates were working properly, that the bells were ringing when he first saw the automobile, that the driver had sufficient warning to enable her to stop short of the crossing, and that after the accident the signals continued to operate properly, except that the wreckage of the automobile had damaged the switch stand at a crossover just west of the station, causing the bells to ring when no train was approaching and necessitating the spiking of a switch point; after this time no further difficulty was experienced. The agent also stated that immediately after the accident he had no difficulty in raising the gates to their normal position. In the operation of these gates the south gate is a trifle slower in going down than is the north gate. In the office at Berwyn there is the usual flagging equipment, consisting of a red flag, torpedoes and fuses, and Agent Lorentz acknowledged that according to instructions he should have run up the track with a red flag and tried to stop train No. 523. He thought he would be able to push the automobile off the track, however, and did not at that time think about making use of his flagging equipment. Agent Lorentz further stated that he did not think it would have made any difference, in view of the short time available and also that he did not think his inability to raise the gates made any difference, in view of the fact that they could not move the machine and that the driver could not get the motor started.

Miss Ethel D. Thomas, driver of the automobile involved, stated that on crossing a bridge which spans a stream about 700 feet south of the crossing, the speed of her automobile was not over 20 miles per hour. She did not increase speed between the bridge and the crossing, saying that as she came up to the crossing she was driving slowly and that she looked in both directions. She started over the first track, which is the siding, at a speed, she thought, less than 20 miles per hour. No whistle was blowing at the time, nor was the gong ringing, and both crossing gates were up. She then looked straight ahead along the road, and when her automobile was on or nearly on the eastbound main track the crossing bell started to ring and then the north gate dropped in front of her, which caused her to apply the brakes; she said she pushed out with both feet, on the clutch with the left foot and on the brake with the right foot, not using the hand brake, and at the same time placed the gear-shift lever in neutral with her right hand, bringing the automobile to a stop across the westbound main track, the north gate being all the way down when she came to a stop; she did not see the gate when it started down. The motor stalled and Miss Thomas then tried to get the motor started by stepping on the starter, saying that the ignition switch was turned on as she had not touched it,

and at this time the agent ran out of the station and told her to get out of the car, as the train was coming. She finally got out of the car and went around to the front of it and tried to push the automobile back off the track toward the south, saying that the front end of the automobile was not up against the gate and that there was plenty of space for her to get in between the gate and the car. On realizing that a collision was imminent the automobile was abandoned, just prior to the impact. Miss Thomas further stated that she was still in the automobile, stalled on the track, when she first saw the train approaching; she thought it was on the curve or had just come around the curve. She usually observed the enclosed disk signal when she approached the crossing in this direction, but did not notice it on the day of the accident. She did not hear anyone call to her before she reached the crossing, and did not think that the crossing bells could have been ringing and that, due to the sound of her motor, in a closed car, she might not have heard them until she reached the point near the eastbound main track, maintaining that she would have heard the bells had they been ringing and that they did not start to ring until she was on the eastbound main track. Miss Thomas, who is 30 years of age, further stated that she has been qualified to operate an automobile since April 2, 1931, possessing a District of Columbia operator's permit. She had not driven any other car except the one involved in the accident and had driven it approximately 3,500 miles. She had handled the car practically every day since she obtained her permit and used this particular crossing at least twice daily in each direction, and sometimes more frequently.

Mr. E. C. Yost, a local resident, was standing on the west side of the highway at a point about 100 feet south of the westbound track; he noticed the automobile when it was about 165 feet south of the track, traveling at a speed of about 30 or 35 miles per hour. When the automobile was nearly opposite him the crossing gates started down and he shouted a warning to the driver as she passed, telling her she would strike the gates, but she did not reduce speed until after she went under the south gate which scraped the top of the automobile, and then she brought the automobile to a stop against the north gate. At this time he saw the train approaching, about 2,000 feet distant, and he at once ran to the automobile and told the driver to get out. The motor of the car was stopped and he and the agent tried to push the car off the track, the agent also trying to raise the north gate by hand. When the train was within about 600 feet of the crossing the automobile was abandoned and then the collision occurred. Mr. Yost could not say whether the crossing bells were ringing, but said he did hear the engine whistle sounded for the crossing.

Mr. Andrew Mothershead, a local resident, stated that he was in a warehouse located on the south side of the tracks and west of the highway, and that he heard the crossing bells start to ring and also the click of the gates starting down, followed in a very few seconds by the sound of a hard application of automobile brakes. He at once went to the front door of the warehouse and then saw the automobile standing on the west-bound main track, the front end of the car being about 2 feet from the north gate; both gates were then down. At this time the train was rounding the curve, and he ran over to the car and the driver remained in the car trying to get the motor started. With three other men, an endeavor was made to push the car off the track, but to no avail, and then the driver got out and the car was abandoned just before the collision occurred. Mr. Mothershead further stated that all the crossing signals were working and that the engine whistle was blowing.

Mrs. Anna Baker, a local resident, said she was sitting on the rear seat of an automobile that stood on the highway at a point about 100 feet north of the crossing, and was looking back toward the crossing. She saw the automobile involved as it approached the other side of the crossing, and in her opinion it was not traveling very fast. She was sure the south crossing gate was not down as the automobile came toward it, and did not think it was coming down as the machine passed under it, but before reaching the opposite side, one of the gates was about half way down, and then for some reason the driver brought the automobile to a stop right on the track. Mrs. Baker could not say whether the crossing bells were ringing or the enclosed disk signal was working prior to or at the time of the accident, but she said that the engine whistle was blowing long and hard until the engine struck the automobile. Mrs. Baker was quite sure that the automobile got under the first crossing gate without the gate hitting the top of the car.

Signal Maintainer Baker stated that he was notified of the accident and reached the scene about an hour after its occurrence. The crossing bells, disk signal, and annunciator or ticker in the agent's office, all work on the same circuit, and on testing them he found that they were working properly.

Water Station Foreman Norris, who maintains the crossing gates, reached the scene of the accident about two hours after its occurrence. He said the gates are known as the Buda pneumatic gates and have to be pumped down and also pumped when being raised to normal position. The air is conveyed to each gate through a one-half inch pipe, and he said that one of the gates lags about one second behind the other gate when being

operated. Mr. Norris said that on his arrival at the scene, he asked the operator then on duty in the station, Agent Lorentz having gone off duty, how the gates were working, and was told that they were all right, which statement he confirmed by his own examination.

A vehicular traffic check made on July 24, 1931, from 7.00 a.m. to 6.00 p.m. showed that a total of 474 vehicles passed over the crossing, both directions, included, during this 11-hour period. The traffic on the railroad for the 30-day period preceding the date of the accident consisted of a daily average of 66 trains, both directions included.

According to the speed-recorder tape on engine 5312, the speed of the train was 74 miles per hour approaching Berwyn, and the air brakes were applied at a point approximately 1,494 feet east of the crossing, reducing the speed to approximately 55 miles per hour at the time of the collision, the train continuing on for a distance of approximately 1,656 feet before coming to a stop.

Conclusions

This accident was caused by an automobile being brought to a stop on a highway grade crossing and the motor being stalled, when a train was approaching, for which the driver of the automobile, Miss Ethel Thomas, is responsible.

Miss Thomas said in substance that she was proceeding at a speed of 20 miles per hour or less, and that after passing the first track of the three-track crossing and when on or nearly on the eastbound track she heard the crossing bells begin to ring and then the north gate dropped in front of her, causing her to stop her automobile so suddenly that the motor stalled; she said she did not see the gates when they actually started to come down and also stated that the north gate was entirely down when she stopped. It is difficult to account for the action of the automobile driver in this case unless she was not as fully on the alert as she should have been when approaching the grade crossing. Her statement indicates that her first warning was when she saw the north gate down in front of her, and she had no recollection of seeing it descending as she approached or started over the crossing. The north gate requires about six seconds to come down from the vertical to the horizontal position while the south gate requires seven seconds. As an automobile traveling at a speed of 20 miles per hour would cover slightly more than 29 feet per second, during the six-second interval required to lower the north gate the automobile would have traveled a distance of more than 170 feet. Allowing for the time

lost in making the sudden stop and also for the one-second slower operation of the south gate, it still would appear that the automobile must have been 100 feet or more from the westbound track and approximately 50 feet from the first of the three tracks when the gates actually started to descend. This deduction is consistent with the statements of Agent Lorentz and the witness, Mr. Yost, to the effect that the gates had started to move before the automobile reached the crossing and that the automobile passed under the south gate as it was on its way down. There is a conflict, however, between the driver's estimate of her speed and those made by some of the other witnesses, and between her statement as to when the bells began to ring and statements made by other witnesses on this point, in addition to the conflict in the statements made as to the position of the gates immediately preceding the stopping of the automobile, but in view of the time interval required to operate the gates there seems little doubt but that the automobile had not yet reached the crossing when the gates started to move, and had the driver exercised the precautions which every driver should exercise on approaching a grade crossing, she would have been able to stop short of the tracks. At a grade crossing not only does railroad traffic necessarily have the right of way, but a train is not under the same degree of control as an automobile, as is evidenced in this case, where the train involved required more than 3,000 feet within which to stop. The traffic density on this highway is not heavy, the view is fairly good when approaching from the south on the highway, and the warning devices provided were working properly and should have been ample to prevent the occurrence of an accident of this character, and apparently the only element lacking was the failure of the driver to have a proper realization of the absolute necessity, not only of materially reducing speed, but of paying very close attention to all of the warning devices in use and of being prepared to stop at any instant. Safety at protected grade crossings requires that automobile drivers observe and heed the warnings of crossing signal devices. Even after stopping on the crossing, and stalling and being unable to start the motor, this accident might have been prevented had Miss Thomas put the car in gear, stepped on the starter switch and used the starter motor to move the car off the crossing.

Approaching the crossing in the direction in which train No. 523 was moving, there is a curve to the left which ends 2,123 feet from the crossing; this represents approximately the view had by the engine crew. There is a station, however, just west of the leaving end of the curve, known as Branchville, and a highway grade crossing nearly 300 feet beyond the end of the curve, and it is more than probable that the engine crew of

train No. 523 did not notice conditions at the crossing at Berwyn until they were passing over the crossing at Branchville. They would then be about 1,850 feet from the Berwyn crossing, and considering the speed of the train it appears that not much more than 3 seconds could have elapsed before the brakes were applied, based on the fact that such application was made practically 1,500 feet from the Berwyn crossing. This is sufficient evidence that the members of the engine crew were on the alert, for it would be unreasonable to expect them to look ahead to Berwyn crossing, realize the situation, and apply the brakes in less time than appears to have been the case.

So far as Agent Lorentz is concerned, when he left his office he should have taken his flagging equipment with him and have endeavored to flag train No. 523, instead of trying to get the automobile off the crossing. It is not believed, however, that his failure in this respect had any direct bearing on the occurrence of the accident, for it is very doubtful whether he could have been seen in time to enable the engineman of train No. 523 to apply the brakes earlier than he actually did.

The casualties resulting from this accident were due entirely to gasoline from the fuel tank of the automobile which caught fire and was thrown into the locomotive cab.

Agent Lorentz was an experienced employee, although he had been located at Berwyn only about one month and had not had any previous experience with the operation of these gates, which, however, are exceedingly simple in their operation; all of the other employees were experienced men, and at the time of the accident none of them had been on duty in violation of any of the provisions of the hours of service law.

Respectfully submitted,

W. P. Borland,

Director.