INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE

PENNSYLVANIA RAILROAD

PITTSBURGH, PA.

DECEMBER 25, 1937.

INVESTIGATION NO. 2238

SUMMARY

Inv-2238

Railroad:	Pennsylvania
Date:	December 25, 1937.
Location:	Pittsburgh, Pa.
Kind of accident:	Derailment
Train involved:	Passenger
Train number:	Second 154
Engine number:	8309
Consist:	7 cars
Speed:	35-40 m.p.h.
Track:	Tangent; 0.3 percent descending
Weather:	Clear
Time:	8:22 a.m.
Casualties:	2 killed and 5 injured
Cause:	Rock which had fallen upon the track

January 26, 1938.

To the Commission:

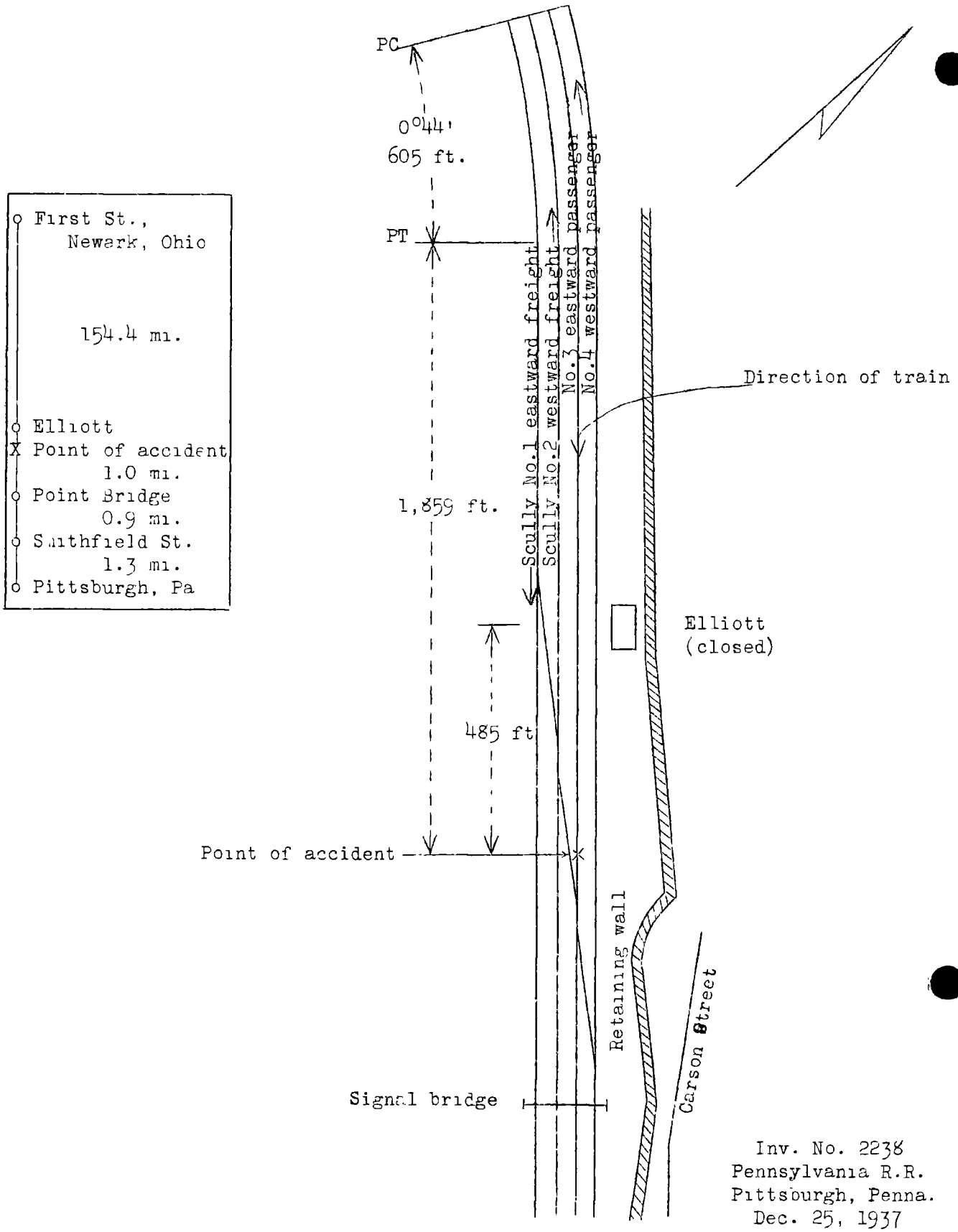
On December 25, 1937, there was a derailment of a passenger train on the Pennsylvania Railroad near Pittsburgh, Pa., which resulted in the death of two employees and the injury of five dining-car enployees.

Location and method of operation

This accident occurred on that part of the Panhandle Division which extends between Pittsburgh, Pa., and First Street, Newark, Ohio, a distance of 157.6 miles. In the vicinity of the point of accident this is a 4-track line over which trains are operated by timetable, train orders, an automatic block-signal system, and a cab-signal system on the passenger tracks. The tracks, numbered from south to north, are: Scully No. 1, eastward freight; Scully No. 2, westward freight; No. 3, eastward passenger, and No. 4, westward passenger. The accident occurred on the eastward passenger track at a point 485 feet east of the old tower at Elliott, and 3.1 miles west of the passenger station at Pittsburgh. Approaching this point from the west there is a 5°24' curve to the right, 1,558 feet in length, then a tangent for a distance of 314 feet, a 0°44' curve to the right 605 feet in length, followed by 2,688 feet of tangent, the accident occurring on this latter tangent, 1,859 feet from its western end. The grade for east-bound trains is 0.3 percent descending at the point of accident.

In the vicinity of the point of accident the tracks which are laid on a side hill cut, parallel Carson Street but are 56 feet above the street level. The hillside along Carson Street is supported by a retaining wall of varying height constructed of masonry and concrete. The slope of the ground between No. 4 track and the top of the retaining wall is approximately 25°; the hillside on the south side of the tracks slopes upward at an angle of about 50° to a height of 90 feet. The south rail of track 4 is approximately 35 feet from the retaining wall.

The main tracks are laid with 130-pound rails, 39 feet in length, with 22 treated ties to the rail length, fully tie-plated with heavy duty tieplates each of which is secured by two railholding and two plate-holding spikes; 6 rail anchors per rail length are used. The tracks are ballasted with



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limestone and crushed slag to a depth of 30 inches and are well maintained. The maximum authorized speed for passenger trains is 60 miles per hour. Beginning on track 1 at a point about opposite the old tower at Elliott there are three cross-overs running from west to east connecting the 4 tracks; the accident occurred on track 3 near the frog of the trailing-point switch of the cross-over connecting track 2 with track 3.

The weather was clear at the time of the accident, which occurred at 8:22 a.m.

Description

East-bound passenger train Second 154 consisted of one express car, one milk car, one express car, one mail car, one dining car, one combination passenger and baggage car, and one club car, in the order named, all of steel construction, hauled by engine 8309, and was in charge of Conductor Brailey and Engineman Rhoads. This train, operating on track 3, passed Corliss, the last open office, 1.3 miles from the point of accident, at 8:20 a.m., according to the train sheet, 7 minutes late, and was derailed 485 feet beyond the tower at Elliott while traveling at a speed estimated to have been between 35 and 40 miles per hour.

The entire train, with the exception of the rear truck of the last car, was derailed. The engine and tender plunged over the retaining wall into the street below, the engine stopping on its left side with its front end approximately 597 feet beyond the point of derailment. The cistern was torn loose from the tender frame and stopped behind the engine; one end of the tender frame rested on the street and the other against the retaining wall. The first car stopped on its left side with its rear end projecting over the retaining wall above the engine. The remaining six cars remained in upright position fouling tracks 4, 3, and 2. The equipment with the exception of the rear car was badly damaged. The employees killed were the engineman and fireman.

Summary of evidence

Conductor Brailey stated that the air brakes were tested at Columbus and were reported as operating properly. He was in the second car from the rear and the train was traveling at a speed of 35 or 40 miles per hour when it started to jerk; he reached for the emergency cord and as he did so the air brakes were applied in emergency. After the accident he saw a trackman about half way between the rear of his train and the tower, but he did not talk with him.

Flagman Smith estimated the speed to have been about 40 miles per hour when the air brakes were applied in emergency and the train became derailed almost simultaneously. He immediately went back to flag and saw the track walker about three car lengths from his train but did not talk with him. On inspecting the track on his way back he saw two or three pieces of rock in the center of track 3, the largest piece being about 10 or 12 inches in length.

Head Brakeman McGee stated that after the accident he saw a few rocks on the track and marks on the rail which appeared to have been made by stones striking the rail.

Hillside Watchman Puppa stated that he went on duty at 6:55 a.m. on the morning of accident, and had made one complete round trip over his territory which extended from Point Bridge to the switch west of Elliott Tower, a distance of 1 mile, and he was on his second trip when the accident occurred. He had walked westward from Point Bridge on track 1, then back on track 2, and on his second trip when walking westward on track 3 he found a few small stones on tracks 1 and 2, the largest being about 9 inches in length and about 1½ inches in thickness; there was only one small stone on track 3. On returning eastward on track 4 he saw the clear indication of the automatic block signal and also saw the train approaching from the west and stepped from track 4 to the north along the pipe line that parallels the tracks. There were no stones on track 3 at that time and as the train passed he did not see any pieces of stone falling down from the hillside. When the train stopped he was about one-half rail length to the rear of the last car. Watchman Puppa stated that when First 154 passed about 12 minutes previously he was walking westward on track 3 and stepped off clear of the tracks near the tool house. Small stones are continually falling down from the hillside upon the track except when the ground is frozen. He removes the small stones and stops a train when a large one is found, but it had been about 2 years since it had been necessary to stop a train.

Track Foreman Kennelly stated that on his arrival at the scene of accident about 9:40 a.m. he inspected the track and found fragments of rock lying on track 3 approximately 150 or 200 feet west of the rear car of the train; part of the rock was between the rails and part of it outside of the rail, the largest piece not weighing more than 1½ or 2 pounds, and the rock appeared to be newly broken. The ties were scraped in the center and a

bolt in the west end of the cross-over frog was bent and muddy marks on it indicated that it had been struck by a rock; the marks beyond indicated that the rock followed the turnout rail to the point of derailment. There were also marks on tracks 1 and 2, indicating that the rock had bounded from track 1 to track 2 and then to track 3 where it stopped. Track Foreman Kennelly stated that he had last inspected the frogs and switches in that vicinity about two weeks previously and found them to be in good condition. He thought that the last time a rock of sufficient size to cause damage to a train had fallen from the hillside was in either March or April of this year.

I. E. Madsen, assistant on engineering corps, stated that he inspected the hillside at the point of accident on the afternoon of the day of the accident and found a cavity near the top of the cliff from which the rock apparently had fallen. The cavity appeared to be 18 inches in height, 10 inches wide and extended back into the hillside about 16 inches; the stratum of rock from which the rock had recently broken off was of hard limestone similar to that found on the track. The bottom of the cavity indicated that the rock had rested on yellow clay formation, which due to excessive rain, had washed away, allowing the rock to be dislodged and fall to the tracks. He did not think that this condition could have been detected by inspection. Below the cavity was a gully filled with clay and muck, and by lining up the marks on the tracks with the gully on the hillside and the cavity, it was indicated that the rock took a diagonal course westward.

Division Engineer Henry stated that on inspecting the track he found the first marks to be on the ties in the center of track 3 at a point 30 feet west of the frog of the cross-over between track 2 and track 3. The next mark was 5 feet eastward on the outside of the south or right rail of track 3, and 10 feet beyond this mark there was a mark on the top of the ties in the center of track 2; a similar mark was also in the center of track 1, 10 feet east of the mark on track 2, indicating that the rock had fallen upon track 1 and then bounded to the other tracks and stopped on track 3. Fragments of rock were found adjacent to the first marks on track 3 and also east thereof and between the tracks. The rocks varied in size from a piece the size of a silver dollar to approximately 6 inches long. It was evident that the rock was struck by the engine and carried along on the ties to the frog where it struck the bolt at the west end of the frog. The marks continued until the rock struck the turnout rail midway between the heel of the switch and the toe of the frog; at this point the first wheel flange marks appeared on the ties 8 inches to the left or north of each rail. It was his opinion that the engine truck wheels were the first to be derailed and on striking the switch of the cross-over connecting track 3 with track 4, the entire engine was deflected to the left. Division Engineer Henry stated that

this particular hillside territory extends from Smithfield Street to the switch west of Elliott, a distance of 2 miles, and is ordinarily divided into two sections, each being patrolled continuously by watchmen on 8-hour shifts; however, under weather conditions similar to those which had existed during the 10 days prior to the accident wherein periods of thawing temperature were succeeded by periods of freezing temperature it was the usual practice to subdivide these two sections into four areas each of which was patrolled by a watchman. A regular weekly inspection, which consists of scanning the hillside from the track level, is made by three supervisory employees, and immediate action is taken to remove any rock that appears to be loose; work of this character had been performed by a mason gang in the vicinity of the point of accident on December 20, 23 and 24.

Assistant Master Carpenter Loughry stated that on December 20 he had worked on the cut at Elliott, attempting to loosen some large rocks which were embedded in clay, and on December 23 the entire cliff was scaled. This work, performed once a week, consists of lowering a man with a bar over the cliff by means of a rope and safety belt, and some rocks had been removed in the vicinity of Elliott tower. Due to the fact that it was raining and the dirt had been washing down from the hill he made a close observation of the cut near the tower on December 24, and at a point approximately 200 feet west of the tower some stones had been removed from a gully. It was his opinion that the rock that fell upon the track was a loose boulder; it came from the ledge and had been entirely surrounded by clay and had worked down through the clay due to the frost and rain.

Observations of Commission's Inspectors

Inspection of the track for a distance of 1 mile west of the point of accident failed to disclose any track condition that could have contributed to the cause of the accident. The first mark was a rough scar across the top of a tie 28 inches inside of the south rail and 42⅓ feet west of the heel of the frog of the trailing-point cross-over between tracks 2 and 3. This scar apparently had been made by something rough skidding toward the east and around it lay a quantity of limestone dust and freshly broken fragments of stone. Similar scars then appeared on eight of the next twenty five ties and above the twenty-sixth tie the end of the first heel block bolt in the frog had been bent toward the east; rock dust adhered to the exposed threads of this bolt and also the second bolt in the heel of the frog and small rock fragments lay on the track nearby. The surface scars continued eastward, and beginning at a point 13 feet east of the toe of the frog a rock-rubbed mark appeared on the north side of the lead rail for a distance of 15 feet; as the lead rail approached the north stock rail, the rock marks appeared on both rails and on the angle bar

bolts and bond wires and the lead rail was pushed out of position toward the south. At a point 37 feet east of the frog a flange mark then appeared on a tie, 10 inches inside of the gauge of the south rail, and 3 feet 7 inches farther east a flange mark appeared on the end of a tie north of the north rail, but there were no flange or other wheel marks on the ball of either rail. The flange marks continued at a uniform distance from the rails to the facing-point switch of the cross-over from track 3 to track 4 and then followed the turnout to the frog which was torn out.

Inspection of the adjacent hillside showed it to be composed of earth, clay and stone, with some overhanging ledges; there was very little vegetation. The debris accumulated in the drainage ditch at the base of the hill indicated frequent occurrences of small slides and falling pieces of stone. A cavity, from which a portion of the ledge had recently fallen, was located near the summit of the cut and about 60 feet east of the first scarred tie, and from this cavity a small gully led downward toward the west for a distance of about 15 feet. At a point between the rails of track 1 about 35 feet west of the ledge the western edge of a tie was crushed and there was a depression in the ballast about 10 by 12 inches in size; marks as described by the railroad officials were found on the other tracks.

An examination of engine 8309 was made after it had been dragged from the point to which it fell on the pavement. The left front portion was crushed and the left cylinder broken off; the pilot and engine truck were torn off and badly distorted. The front axle was bent and the wheels deeply scarred but the flanges were intact and in good contour. The pilot was bent backward and showed rubbing scars on the bottom plate and a slight adherence of rock dust, the source of which was not conclusively indicated. The cars, which had been removed to Corliss, were badly damaged underneath, particularly the trucks of the first three, but nothing was observed to indicate the existence of any defects prior to the time of derailment.

Discussion

The evidence indicates that the engine struck a rock lying between the rails, and that apparently this rock was shoved ahead of the engine for a distance of about 70 feet where it encountered the lead rail of a trailing-point switch and became caught beneath the pilot. The front end of the engine was thus raised sufficiently to permit the front engine truck wheels to become derailed to the left. A cavity measuring about 18 by 10 by 16 inches, from which a rock had recently been dislodged, was found near the summit of the hillside and below this cavity there was a small gully.

The marks on the tracks indicated that a rock had fallen upon track 1, then bounced to track 2 and then to track 3 where it stopped. It appears that the rock came down upon the track immediately in front of the approaching train. The engineman apparently did not have any warning, as the brakes were not applied until about the time the train became derailed.

The section of track on which this accident occurred is continuously patrolled by one watchman in each 8-hour shift. The section extends between Point Bridge and Elliott Tower, a distance of 1 mile, and the watchman on duty at the time of the accident had just walked over tracks 1, 2, and 3, and was walking eastward on track 4 when he saw Second 154 approaching. He stepped to the north of the tracks to watch it pass and did not see any rocks on the tracks, nor did he see any stones falling from the hillside. When the derailed train stopped he was about two rail lengths wes of the rear car, or approximately 135 feet east of the first scarred mark on the tie made by the rock.

Alternate freezing and thawing weather had prevailed just prior to the time of the accident, and it had been raining on the day prior to the accident; on that day the cliff had been scaled and several stones had been removed from a gully near Elliott tower.

Conclusion

This accident was caused by a rock which had fallen upon the track.

Respectfully submitted,

W. J. PATTERSON,

Director.