INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN ACCIDENT ON THE BALTIMORE & OHIO RAILROAD AT SAND PATCH, PA., ON FEBRUARY 28, 1934.

May 14, 1934.

To the Commission:

On February 28, 1934, a freight train on the Baltimore & Ohio Railroad broke in two at Sand Patch, Pa., and the rear end of the caboose was crushed by the helper engines coupled behind the caboose, the accident resulting in the death of one employee.

Location and method of operation

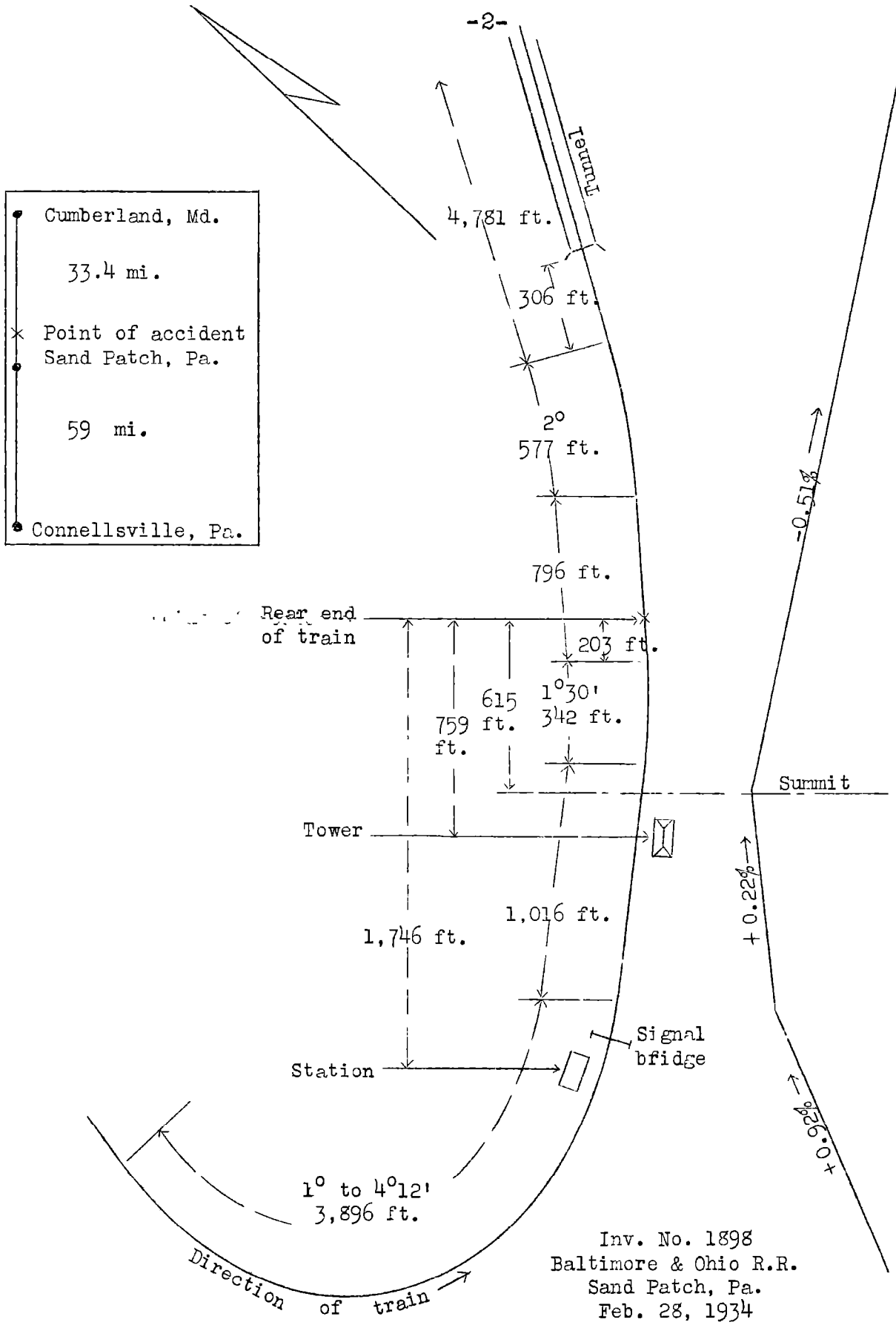
This accident occurred on the Main Line Sub-division of the Pittsburgh Division which extends between Connellsville, Pa., and Cumberland, Md., a distance of 92.4 miles. In the vicinity of the point of accident this is a double-track line over which trains are operated by time table, train orders, and an automatic block-signal system. The accident occurred on the east-bound track, with the rear of the train at a point 1,746 feet east of the station at Sand Patch and 615 feet east of the crest of grade over the Alleghany Mountains. Approaching this point from the west there is a compound curve to the left 3,896 feet in length, followed by tangent track for a distance of 1,016 feet, a $1^{\circ}30'$ curve to the left 342 feet in length, and tangent track for a distance of 796 feet, the rear of the train being on this tangent at a point 203 feet from its western end, or nearly 1,500 feet west of the west portal of Sand Patch tunnel, which is approximately, 4,475 feet in length.

The grade for east-bound trains is 0.92 and 0.93 percent ascending for a distance of approximately 5 miles, followed by an ascending grade of 0.22 percent for approximately 1,000 feet to the summit; the grade is then 0.51 percent descending for a distance of more than 1 mile and the accident occurred on this descending grade.

The weather was clear and extremely cold at the time of the accident, which occurred at 9:42 a.m.

Description

East-bound freight Train Second No. 94 consisted of 71 loaded cars and a caboose, hauled by engine 6223, and was in charge of Conductor Fair and Engineman Hurley. This train left



Inv. No. 1898
Baltimore & Ohio R.R.
Sand Patch, Pa.
Feb. 28, 1934

Connellsville, 59 miles from Sand Patch, at 6:07 a.m., according to the train sheet, with helper engine 6166, in charge of Engineman Coughenour, coupled behind the caboose; at GA Tower (Yoder), 8.2 miles west of Sand Patch, a stop was made and helper engine 6196, in charge of Engineman Thomas, was coupled behind engine 6166. This train then left GA Tower at 9:17 a.m., proceeded up the grade to Sand Patch, and an attempt was being made to uncouple the two helper engines from the caboose when the train parted, causing an emergency application of the air brakes, at which time the speed was estimated to have been between 15 and 20 miles per hour.

The south corner of the steel rear platform of the caboose was crushed, the rear end being forced over toward the westbound track. The rear coupler was broken off and the left corner of the front platform was slightly crushed by the end of the car ahead of it. The rear truck of the caboose was derailed, and engine 6166 was slightly damaged. The coupler in the front end of the first car in the train was broken off, as was the rear portion of the coupler yoke in the front end of the nineteenth car. The employee killed was the helper flagman, who was crushed between the caboose platform and pilot of engine 6166.

Summary of evidence

Engineman Hurley, of the road engine, stated that the air brakes were tested at Connellsville and no trouble was experienced in handling the train en route. The last stop before the occurrence of the accident was at Yoder, where the second helper engine was attached to the rear of the train. No air-brake test was made after this engine was coupled to the train and he did not know whether or not he had control of the brakes on that engine. When his engine was at a point about 30 car lengths west of the west portal of the tunnel at Sand Patch he made an air brake application sufficient to assure himself that there was no obstruction in the brake pipe and then released immediately. As he neared the tunnel portal he shut off steam, letting the helpers shove the train over the crest of the hill, and was traveling at a speed of about 20 miles per hour, with his engine about 30 car lengths inside the tunnel, when the train jerked and the air brakes applied in emergency; he placed his independent brake valve in full release and the engine stopped about 1½ car lengths beyond the head end of the train. After the accident he found that the coupler was broken on the front end of the first car, as well as the coupler on one of the other cars. Fireman Logue stated that on entering the tunnel the speed had been reduced to 10 or 15 miles per hour and when about 40 car lengths inside the tunnel the train seemed to stretch and the brakes applied. Head Brakeman Cassell was turning up retaining valves preparatory to descending the mountain and when about 35 car lengths from the engine he heard the air

brakes applying, the train making several bad jerks and stopping suddenly. On going forward about 15 car lengths he found a coupler pulled out on the front end of one of the cars and the coupler also was out on the first car in the train. Brakeman Cassell did not recall any application of the brakes before the train entered the tunnel.

Flagman Keys stated that at Connellsville he made the coupling between helper engine 6166 and the caboose without difficulty. When the second helper was coupled on at Yoder he was out on the train and after leaving that point he turned up the retainers until he met the head brakeman. Flagman Keys felt the brakes apply when the running test was made, and just as the car on which he was riding entered the tunnel the train surged and stopped, which he supposed was due to an emergency application of the air brakes; he had not felt a pull-back of the train prior to this time. On previous occasions he had experienced no trouble in detaching helper engines at Sand Patch, and he said that the head end of the train always gets a little tug when the helpers are cut off and the train is over the summit of the grade.

Conductor Fair stated that when the caboose was about 400 or 500 feet west of the signal bridge located just east of the station he gave the engineman of the first helper engine a signal that he had closed the angle cock on the caboose; this signal was acknowledged by a hand signal and also by two blasts of the whistle. He raised the chain attached to the uncoupling lever on the rear end of the caboose, holding it up until the engine was separated sufficiently from the caboose to open the knuckle. He then stepped to the south side of the caboose to give the engineman a steady signal and a signal to stop, but the chain slipped out of his hand and a rebound occurred, the helper being recoupled and the train was stretched with a slight jerk. He then signalled the engineman for slack; the signal was observed immediately and the engineman opened the throttle, but sufficient slack was not obtained to enable him to uncouple the helpers in this second attempt and the impact of the accident coming immediately afterward threw him off the caboose. Conductor Fair further stated that at GA tower he coupled the second helper engine to the rear of the train but was unable to say whether or not the air was working through both helper engines as no air-brake test was made after this coupling was made. Conductor Fair also stated that while he had not seen the flagman of the helper engine immediately prior to the accident, he believed that the flagman had attempted to assist him in uncoupling the helpers from the caboose; he was found pinned between the caboose and the smoke box of engine 6166.

Engineman Coughenour, of helper engine 6166, stated that he received a signal from the conductor to cut in his brake

valve, indicating that the angle cock on the caboose had been closed. Shortly afterwards he commenced to ease off on the throttle and when about opposite the tower he received a signal from the conductor to stop helping, at which time he lapped his automatic brake valve and shut off steam. Soon afterwards the conductor signaled him to come ahead and he placed his brake-valve in release position and opened the throttle until the slack was taken up. After proceeding about six car lengths the conductor gave him another signal to stop helping and he immediately lapped the brake valve and closed the throttle, and about 1 second later there was a jar and he saw the caboose rise onto the pilot of the engine. He did not feel any jerk before the accident occurred nor did he feel the head end of the train run away from him at any time.

Engineman Thomas, of helper engine 6196, stated that when his engine was coupled to the rear of the train at Yoder no air-brake test was made but the brake on his engine released when the air was cut in. On approaching Sand Patch he noticed the engineman of the road engine making a running test of the brakes; the speed was reduced and he thought the train was coming to a stop, but it then picked up speed. When his engine was about 15 car lengths west of the summit board he started easing his throttle and when about 4 car lengths from the summit board he shut off entirely. On seeing the signal given by Conductor Fair to come ahead he opened his throttle, using steam until he thought the conductor had a chance to raise the uncoupling lever, and when he was over the summit he closed the throttle and about 2 seconds later he felt the brakes apply in emergency and the accident occurred. Fireman Mengers, of the second helper engine, stated that the speed was about 18 or 20 miles per hour when his enginemen first started to ease off on the throttle, and he thought the speed was about 15 miles per hour at the time of the accident.

Operator Kerrigan stated that he was standing in the tower watching the train as it passed. As the rear end of the train went by he saw the helper flagman standing on the pilot beam of the first helper and the conductor standing about at the center of the rear platform of the caboose with the cutting chain in his hand as though he was cutting off the helpers. The helper engines were not using steam at that time, but when about 200 feet east of the tower they started using steam and then he heard a crash and the train stopped.

Car Inspectors Unazie and Marino inspected the cars in Train Second No. 94 on its arrival at Cornellsville on the morning of the accident and found no defects; this was a class "C" inspection and required about 20 minutes. Inspector Marino then inspected the brakes, including those on the caboose and helper engine, and found them to be working properly. The couplers of the caboose and helper engine were of uniform height; a chain extended from the hand rail at the rear of the caboose to the uncoupling lever, and the uncoupling mechanisms

of the caboose and helper engine were in good condition.

Examination of the head end of the nineteenth car by the Commission's inspectors disclosed that the draft gear yoke was broken off at each rear angle of the loop; approximately 15 percent of each fracture was slightly oxidized. The draw-bar at the head end of the first car was broken at the keyway, apparently a new break resulting from the accident. The 5-by-7-inch shank of the A.R.A. type D coupler in the rear end of the caboose was broken off, also apparently a new break.

The three engines in Train Second No. 94 were of the Santa Fe type, each having a rated tractive power of 84,300 pounds and a total weight including tender of approximately 367 tons; consequently a total rated tractive power of 168,600 pounds was exerted against and total motive power weight of approx-imately 734 tons was placed behind the caboose of this train. The caboose was of steel-underframe construction, with steel platforms and composite steel and wooden superstructure, and in general was of substantial construction.

Conclusions

This accident was caused by Train Second No. 94 breaking in two between the eighteenth and nineteenth cars.

The break-in-two which resulted in this accident probably was due to a combination of several factors. When Conductor Fair first made an attempt to cut off the helper engines the major portion of the train was on the descending grade and it is believed that with the helper engines being eased off and throttles finally closed preparatory to cutting off from the caboose, the train was stretched out and extra strain exerted on the defective coupler yoke on the nineteenth car, resulting in its failure. The temperature was reported to have been about 27° below zero and may have been a factor by reason of increasing the brittleness of the metal. The parting of the train in turn caused an emergency application of the air brakes, with the consequent derailment and damage to the caboose due to the force exerted by the two helper engines behind it. While the coupler on the first car in the train also was broken, there was no indication of an old defect, and it is believed that this break was a result of the accident.

Attention is called to the potential hazard involved in massing motive power against any caboose car or car used for similar purposes. The caboose involved in this accident was well constructed, but its strength was insufficient to with-stand the crushing force exerted by the two heavy helper engines when the brakes on the train were applied in emergency after the angle cock at the rear of the caboose had been closed and when steam was being used on the helpers to provide

slack necessary to uncouple them. The caboose drawbar failed under compression, a part of the rear platform was crushed, and the fatality resulted. On February 13 and March 3 there were similar accidents on this division involving west-bound trains on the east side of the mountain; in each case the train broke in two, the helper engine crushing the caboose although fortunately no fatalities or injuries resulted. There also was another accident on March 4 on the Baltimore Division wherein a train of 133 cars broke in two and three cabooses on the rear were considerably damaged by the two helper engines behind them. This latter accident was investigated by this Bureau, and a separate report will be issued.

Respectfully submitted,

W. J. PATTERSON,

Director.