INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN ACCIDENT ON THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS RAILWAY NEAR DeGRAFF, OHIO, ON JULY 25, 1932.

September 15, 1932.

To the Commission:

On July 25, 1932, there was a derailment of a freight train on the Cleveland, Cincinnati, Chicago & St. Louis Railway near DeGraff, Ohio, which resulted in the injury of one employee and one trespasser. This accident was investigated in conjunction with the Ohio Commission of Public Utilities.

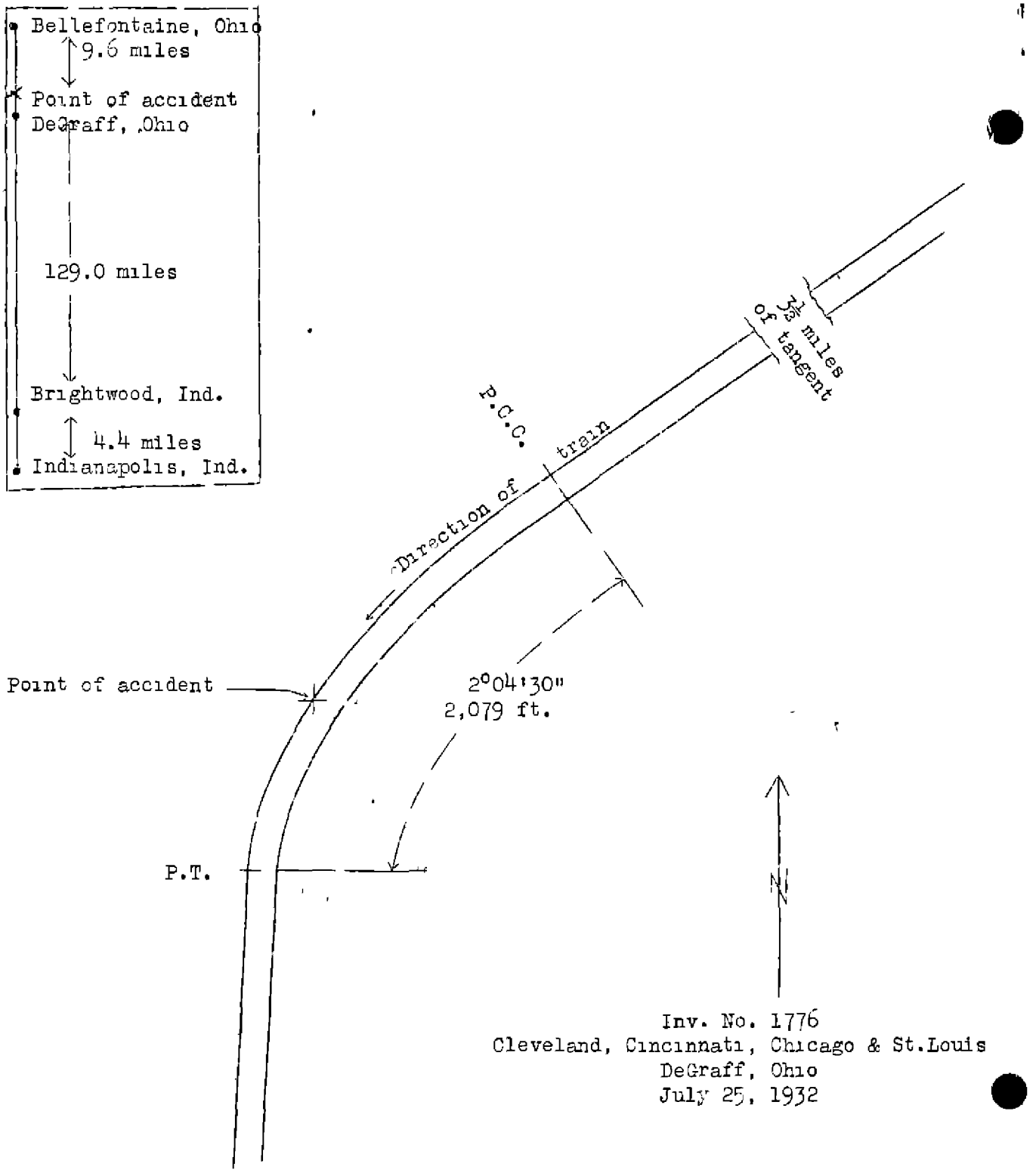
Location and method of operation

This accident occurred on that part of the Cleveland-Indianapolis Division extending between Bellefontaine, Ohio, and Indianapolis, Ind., a distance of 143 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 about 2½ miles east of DeGraff; approaching from the east the track is tangent for about 3½ miles, followed by a compound curve to the left 2,079 feet in length, including spirals, with a maximum curvature of 2° 04' 30", the accident occurring on this curve at a point about 1,367 feet from its western end. The grade for westbound trains is descending for about 2 miles to the point of accident, and for about 475 feet beyond, varying from 0.185 to 0.781 per cent, and being 0.445 per cent at the point of accident.

The track is laid with 105-pound rails, 33 feet in length, with 20 hardwood ties to the rail-length, single-spiked, fully tie-plated and ballasted with washed gravel to a depth of about 13 inches, six hole angle bars are used and there are four anti-creepers to the rail-length. The standard superelevation of the outside rail of the curve is 5 inches, a variation from 1/16 inch high to 5/16 inch low being permitted; measurements after the accident disclosed that the superelevation east of the point of derailment varied from 5/16 inch low at several points on the curve to 3/16 inch high at one point. The alinement was good and all ties were well tamped.

Preferred freight trains are limited to a speed of 50 miles per hour.

The weather was clear and the temperature was about 89° at the time of the accident, which occurred about 3.42 p.m.



Inv. No. 1776
Cleveland, Cincinnati, Chicago & St.Louis
DeGraff, Ohio
July 25, 1932

Description

Westbound freight train No. 97 consisted of 74 cars and a caboose, hauled by engine 6217, of the 4-8-2 type, and was in charge of Conductor Wells and Engineman Parsley. This train left Bellefontaine, the last open office and 9.6 miles east of DeGraff, at 3.25 p.m., according to the train sheet, 3 hours and 24 minutes late, and was derailed while approaching DeGraff at a speed estimated to have been between 45 and 60 miles per hour.

Engine 6217 was not derailed, it stopped about one-half mile beyond the point of derailment with eight cars coupled behind it, the train having broken in two between the eighth and ninth cars. Forty cars were derailed, twenty-two being so badly damaged that it was necessary to destroy them, the tenth to the forty-fifth cars, inclusive, were either overturned or resting crosswise of both main tracks. About 400 feet of the westward track was torn up and the eastward track was pushed off the roadbed for a distance of about 600 feet.

Summary of evidence.

Engineman Parsley stated that approaching this curve the speed of the train was about 50 miles per hour; he was standing in the deck when he felt the engine lurch, the fireman and head brakeman, who were on the left side of the engine on the inside of the curve, shouted to him to keep the train going as the track was kinked; he continued to use steam and the engine and eight cars that remained coupled to it were stopped by the emergency air brake application that resulted when the train broke in two at the point of derailment. Prior to the accident he had made no air brake application, steam was being used lightly while rounding the curve. The air brakes were tested before departing from Bellefontaine and worked properly and the engine was in good condition. Fireman Berry and Head Brakeman McCollum were riding on the left side of the engine, looking across the inside of the curve they saw section men on the eastbound main track and about the time they passed these sectionmen they saw an S-shaped kink in the track, about two car lengths in front of the engine, the track being out of line 3 or 4 inches; the engine lurched when it reached this kink and cars behind began to leave the track. None of these employees had noticed any irregularities in track conditions while rounding this curve on previous trips, covering a period of about 22 years. Conductor Wells and Flagman Swisher thought the speed of their train was 45 or 50 miles per hour at the time of the accident.

Section Foreman Bodenmiller in charge of the section on which this accident occurred comprising 4½ miles of double track, has six men and was permitted to work only three days per week which he did not consider adequate to maintain the track in proper condition. He had done some work on this curve surfacing the track on July 21 and 22, and on the date of the accident found some places on the curve where the track was out of line.

As it would be several days before his own section crew would again work on this part of his section he went to the adjoining section to the west and got Section Foreman Brown and his men, returning to this curve with them at about 2.30 p.m. They lined up the track throwing it in about half an inch, and train No. 3 passed over it at a speed of about 35 miles per hour without incident. As train No. 97 approached, the two foremen and five section men were standing on the eastbound track 5 or 6 car lengths east of where the accident occurred; the train passed them at a speed estimated by the section foreman at 55 or 60 miles per hour. A short distance beyond, the engine swerved and the accident occurred. Section Foreman Bodenmiller stated that no work had been performed at the point where the accident occurred, but that the track had been lined about 1 or 1½ rail-lengths east thereof; during this work the ties and rails were moved not to exceed one-half inch and the ties were raised slightly. No slow boards were put out. Less than one minute before train No. 97 passed he looked down along the track but noticed nothing wrong, and he thought that had the track then been kinked he would have noticed it. The shoulder ballast on the outside of the curve at the point of accident was a little scant, but not enough in his judgment to endanger the track, it had been that way for quite a while and had held properly. No previous trouble had been experienced with the track creeping or kinking on this curve during the 6½ years that he had maintained it; he went over the track on this curve every day, but it appeared in no worse condition on this date than heretofore.

Westbound passenger train No. 3, scheduled to leave Bellefontaine at 2.45 p.m., left on time, according to the train sheet, and Section Foreman Brown stated that this train passed properly around the curve where the track had been lined; after it passed he looked at the track and it was all right. Work of lining had been completed before the arrival of train No. 97 and the section crews were preparing to depart. Both section foremen were of the opinion that the accident was caused as a result of a track kink, Section Foreman Brown thought that the kink was made by the engine of train No. 97.

Track Supervisor Borgman rode over this curve on the rear end of a westbound passenger train on July 23, and on the day prior to that he walked over it, on both occasions the track was found to be all right. Particular attention has been paid to expansion, alinement and surface, wherever expansion is found to exist the bolts are loosened to accommodate it. The roadbed is firm at the point where the accident occurred, the track was built in 1925 and laid with new rails and no trouble had previously been experienced there. In his opinion lining the track on the curve would not have a tendency to tighten it enough to cause a kink.

Maintenance of Way rule 664 of this railroad reads as follows:

> To prevent undue stresses in rails due to contraction and expansion during sudden and wide changes of temperature, sufficient bolts and angle bars should be loosened to permit the rail to adjust itself and then

> the bolts shall be retightened. At all other times the bolts shall be kept tight.

Under date of July 19 a general notice was issued reading in part as follows:

> During the extremely hot weather, where track is being raised and ballast has been loosened up, there is possibility of track kicking out where speed is too great or where there is violation of speed restrictions.

Examination of the track by the Commission's inspectors subsequent to the accident disclosed track conditions in general to be good, however, the gravel shoulder ballast on the outside of the westbound main track on the curve involved was about 8½ inches narrower than the standard of the railroad and the angle bar bolts were tight enough to interfere with adjustment of the rails on account of expansion as a result of high temperature; there was sufficient space at the ends of the rails to have allowed for this expansion provided the bolts had been temporarily loosened to permit of track adjustment and then retightened, as required by maintenance-of-way rules, but the nuts of the angle bar bolts were covered with oil and dirt and showed no evidence of a wrench having recently been used on them. These conditions existed from the summit of the descending grade to a point near where the track and roadbed were disturbed due to the derailment. Careful inspection of the engine and equipment failed to disclose any defect that would have caused or contributed to the accident.

Conclusions

This accident was caused by a kink in the track.

The evidence indicates that the track buckled directly in front of the engine of train No. 97. Work of lining the track on the curve just east of where the accident occurred had been completed and a westbound passenger train had passed safely around the curve only a short time prior to the occurrence of the accident. Two section foremen engaged in the track work had looked along the rail just before the arrival of the freight train involved, but noticed nothing wrong with the track at that time. Examination of the track subsequent to the accident over such portion of the curve as had not been disturbed by the derailment, however, disclosed that there was a shortage of ballast at the ends of the ties and that angle bar bolts were tight enough to interfere with the adjustment of rails due to expansion during hot weather.

These conditions, attributable to inadequate track maintenance, contributed materially to the cause of this accident.

The estimates of the rate of speed of this train varied from 45 to 50 miles per hour by members of the train and engine crew to 55 or 60 miles per hour by the two section foremen. The time-table speed restriction applicable to this train was 50 miles per hour. It is believed that the condition of the track did not provide a sufficient factor of safety for this relatively high rate of speed.

Respectfully submitted,

W. P. Borland,

Director.