REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE WESTERN MARYLAND RAILWAY NEAR BARNUM, W. VA., ON AUGUST 16, 1923.

October 12, 1923.

To the Commission:

On August 16, 1923, there was a derailment of a passenger train on the Western Maryland Railway near Barnum, W. Va , resulting in the death of two employees, and the injury of ten passengers and five employees.

Location and method of operation.

This accident occurred on that part of the Elkins Division extending between Cumberland, Md., and Thomas, W. Va , a distance of 77.2 miles, in the vicinity of the point of accident this is a single-track line over which trains are operated by time-table and train orders, no block-signal system being in use The accident occurred about 1 mile west of the station at Barnum; approaching this point from the west there are numerous sharp curves and short tangents, followed by a curve to the left, with a maximum curvature of 15° 15', for a distance of approximately 450 feet to the point of accident The grade for eastbound trains is 0 52 per cent descending for a distance of 900 feet, then 0.98 per cent for 2,700 feet, level for 2,000 feet, and then 1 03 per cent descending for 200 feet to the point of accident. The track is laid with 90-pound rail, 33 feet in length, with 18 white oak ties to the rail-length, tie-plated, about 60 per cent of the plates having one spike on the inside of the rail and three spikes on the outside, while the balance have one spike on the inside and two on the outside, and ballasted with limestone and cinders, about 3 feet in depth, no rail braces are used. Six hole angle bars are used, fully bolted with 15/16 inch bolts, joints suspended and fully spiked The rail on this curve was rolled in 1918 and laid in 1919 The track is well maintained. In this vicinity the track is bordered on the north by the Potomac River and on the south by bluffs of considerable height; between the river and the roadbed there is a steep embankment. The weather was clear at the time of the accident, which occurred at about 10.42 a. m.

Description.

Eastbound passenger train No. 10 consisted of one baggage and mail car, and two coaches, of all-steel construction, in the order named, hauled by engine 205, and was in charge of Conductor Mignot and Engineman Mickey. This train left Shaw, nearly two miles west of the point of derailment, at 10.40 a m 11 minutes late, and was derailed while traveling at a speed estimated to have been between 25 and 35 miles an hour.

Engine 205, together with its tender, was derailed to the right, the engine coming to rest on its right side, badly damaged, and the tender bottom up, the head end of the engine was 210 feet from the initial point of derailment. All three cars were derailed but remained partially or wholly on the roadbed, the first car came to rest with its head end 260 feet from the initial point of derailment, while the rear end of the last car in the train was 21 feet east of the first mark of derailment The employees killed were the engineman and fireman.

Summary of Evidence.

Conductor Mignot stated that he noticed nothing unusual with the handling of the train, no trouble was experienced in making the various stops en route, and the first knowledge he had of anything wrong was on feeling the train leave the rails, at which time he estimated the speed to have been between 25 and 30 miles an hour Although Fireman Poling was badly injured as a result of the accident, and died shortly afterwards, immediately after the derailment Conductor Mignot talked with him and was informed that the engine was the first to leave the track, and that the train was going too fast around the curve. On examining the track he found that some rails were overturned and there were several spikes drawn about a rail-length from where the first mark appeared on the ties He stated in his estimation the track condition was good for the speed permitted, but the indications were that the speed of the train was too great on this curve.

Flagman Schafer estimated the speed of the train to have been about 30 miles an hour at the time of the accident He had noticed nothing unusual with the handling of the train prior to the accident, and stated the air brakes worked properly en route. Baggagemaster Bignan estimated the speed of the train to have been about 35 miles an hour at the time of the accident.

The wires beside the track were torn down as a result of the accident, and Train Dispatcher Weber, on duty at the time, stated that at 10·40 a. m. he was sending a bulletin to Thomas, Bayard, and Harrison, and, that it was about 10·42 a. m. when the wires failed.

Track Foreman Shrout, in charge of the section on which this accident occurred, stated that all necessary work was performed to put the track and roadbed in shape on the curve in question on August 4, 1923, this work consisting of tightening bolts and spikes and surfacing parts which needed it; he had also passed over the track on the day before the accident. About 65 or 70 per cent of the ties on this curve were renewed in October, 1922,

and new ballast was laid in 1921; the drainage is good. Track Foreman Shrout further stated that no trouble was experienced with spikes working loose on this curve and the indications were that the accident was caused by excessive speed, resulting in the rail overturning. He did not find any marks west of the overturned rail.

Engineman Rowan, who has been in the employ of this railroad for 34 years, stated that he usually operates trains around this particular curve at a speed of about 15 miles an hour, and on the day prior to the accident he noticed nothing unusual in this vicinity. He said the speed should be so low on account of the curve and not on account of track conditions.

Superintendent Williamson and Division Engineer Hornbaker thought the accident was caused by excessive speed, resulting in the outside rail on the curve turning over. Superintendent Williamson stated that the speed limit of 30 miles an hour in this vicinity was not to be used on curves; however, he was of the opinion that this curve could be rounded safely at this rate of speed.

Mechanical Superintendent Little stated he was present when engine 205 was rerailed and an examination of it after reaching the shops disclosed that on one side of the right rear driving wheel the tire was driven in on the rim, evidently a result of the wheel striking something when leaving the track, however, the fit was tight on the other half of the rim. He further stated that this type of engine is designed for a maximum curvature of 22-degrees; that engine 205 had just been turned out of the shops, and that he personally inspected it before it left Thomas on this trip An examination made of it after the accident, by himself and Road Foreman of Engines Dotson, failed to disclose any defect which would have contributed to the accident.

Following the accident the south rail, under the two rear coaches, was found turned over; it was canted outward, back to and a few feet west of the point where the first marks were found on the ties, with the right rear truck wheels of the rear car resting on the gauge side of the web. Flange marks were found on the gauge side of the web of the rail, close to the head of the rail, commencing at a point about 10 feet east of where the first marks appeared on the ties. This mark continued along the web of the rail to the first joint east, where there was a distinct flange scarring on the angle bar. East of the angle bar no further flange marks appeared on the web of the rail

Measurements made of the track from a point 465 feet west of the initial point of derailment, at intervals of every 15½ feet, to within 31 feet of where the accident occurred, showed the gauge and elevation to be well maintained, the maximum elevation was 4 5/8 inches. The first mark of derailment was a very light mark on the end of a tie, about 9 inches from the outside of the base of the outside rail on the curve, about 12 feet east of this point there were similar marks on the gauge side of the inside rail. These marks appeared on each succeeding tie, becoming more pronounced, for a distance of half a rail-length, beyond which point the track was badly torn up.

Engine 205 is of the 4-6-2 type, class K-2, having a total weight, engine and tender loaded, of 402,300 pounds; its driving wheel base is 12 feet 6 inches, and total wheel base, engine and tender, 67 feet 3 7/16 inches. This engine received class 2 repairs at the Baldwin Locomotive Works on November 10, 1922, and class 5 repairs at the Hagerstown erecting shop on March 23,1923.

Under special instructions contained in time-table No. 6, effective June 17, 1923, the speed of passenger trains is limited to 30 miles an hour in the territory in which the accident occurred. According to the train sheet, train No 10 left Bayard at 9.49 a. m. and the accident occurred at a point more than 25.5 miles distant, at 10 42 a m , this distance being covered in 53 minutes, an average speed of more than 29 miles an hour When taking into consideration the time consumed in making the various station stops, and the delay occasioned between Harrison and Blaine, it is obvious that the maximum speed permitted, 30 miles an hour, must have been exceeded in order to maintain a 29-mile-an-hour average. It is also noted that according to the train sheet an average speed of more than 35 miles an hour was maintained between Bayard and Schell, a distance of 10 miles, 7 minutes being made up on the schedule between these points, not allowing for time taken in making two stops at intermediate points An average speed of 38 25 miles an hour was made between Schell and Harrison, a distance of 5.1 miles, and 4 minutes was made up on the schedule. Between Harrison and Blaine,a distance of 1.7 miles, a delay was occasioned by striking a cow, 5 minutes being lost on the schedule between these points. Between Blaine and Shaw, a distance of 7.2 miles, an average speed of 36 miles an hour was maintained, with a stop at one intermediate station, 2 minutes being made up on the schedule, while according to the train sheet, the distance between Shaw and the point of accident, 10,168 feet, was covered in 2 minutes, an average speed of more than 57 miles an hour

Conclusions.

This accident was caused by excessive speed

Apparently the rate of speed at which the engine rounded the curve was so great that the outside rail of the curve was unable to withstand the strain imparted to it by the weight of the engine. The record shows conclusively that the maximum speed permitted was greatly exceeded en route There is no evidence that the condition of either track or equipment was in any degree responsible for the accident.

All of the employees involved were experienced men. 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.