

INV. 309.

January 24, 1916.

IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON
THE CHICAGO, MILWAUKEE & ST. PAUL RAILWAY,
NEAR POCONO, ILLINOIS, ON NOVEMBER 15, 1915.

On November 15, 1915, there was a derailment of a freight train on the Chicago, Milwaukee & St. Paul Railway near Pocono, Idaho, which resulted in the death of 1 trespasser and the injury of 6 trespassers, one of whom afterwards died. After investigation of this accident, the Chief of the Division of Safety reports as follows:

The part of the Chicago, Milwaukee & St. Paul Railway on which this accident occurred is a single-track line, train movements being protected by the automatic block signal system. Approaching the point of derailment from the east the track is on a tangent for a distance of 1,024 feet, followed by a curve of 7 degrees 30 minutes leading to the right, this curve being 1,026 feet in length. The first marks of derailed wheels were nearly in the middle of this curve. The track is laid with 90-pound rails, with from 20 to 22 ties under each rail, tie-plated and double-spiked on curves. The grade is .4 percent descending for westbound trains. At the time of the accident it was raining and snowing.

Westbound freight train End No. 93 consisted of 39 cars and a caboose, hauled by locomotive 5823, and was in charge of Conductor Steege and Engineman Davis. It left its terminal, Avery, Idaho, at 8:35 a.m., and at 10:10 a.m. was derailed about 2 miles east of Pocono while running at a speed estimated to have been about 15 or 20 miles an hour.

The eighteenth car in the train, Baltimore & Ohio Con-
dola No. 147716, was the first car to be derailed and was followed
by the derailment of 9 other cars. Five of the derailed cars re-
mained upright on the roadway while 5 were piled upon the south
side of the track, 2 being destroyed and the others badly damaged.

Examination of the track showed that there was a flange
mark about 3,600 feet east of the initial point of derailment, this
mark being on the gauge side of the left rail, about one-sixteenth
of an inch in depth and one-fourth of an inch in length. The mark
was fresh and had the general appearance of marks found nearer to
the point of derailment. The next flange marks were found on the
gauge side of the left rail about 335 feet west of the beginning
of the spiral of the curve on which the accident occurred. At this
point there were 16 marks, 8 feet 8 inches apart, showing where a
broken flange had struck the rail. These marks varied in depth
from a slight abrasion to a mark one-eighth inch in depth. There
were then 7 distinct flange marks about three-sixteenths inch in
depth and separated from each other by the following distances:
4-3/4 inches, 4 inches, 4-1/4 inches, 4-1/2 inches, 4-1/2 inches, and 5 inches.
The last of these 7 marks or cuts was nearly in the center of the
ball of the rail. The next mark west of this point was a sharp
cut 9 feet 2 inches in length, running diagonally across the rail,
made by a broken flange. There was then found on the outside of
the left rail a flange mark on the head of a spike and correspond-
ing to the flange and wheel marks on the ties on the inside of the
opposite rail, these marks indicating where the first pair of
wheels with broken flanges left the rails. About 60 feet beyond
this spike mark were found 13 slight flange marks on the gauge

side of the left rail, about 2 inches apart, covering a total distance of about 47 inches, these marks being about one-sixteenth inch in depth. At a point 2 feet 6 inches beyond these marks was found a flange mark three-sixteenths inch in depth, followed at a distance of 2 feet 6 inches, by 2 flange marks 1 inch apart, 1 inch in length and three-sixteenths inch in depth, while 2 feet beyond this point was a flange mark about one-eighth of an inch in depth near the center of the ball of the rail, all these marks being on the gauge side of the left rail. A distance 5 feet 2 inches beyond this point was found a mark which cut into the ball and led horizontally across the rail to where a flange mark was found on the head of a spike on the left side of the rail, with corresponding marks on the ties on the inside of the right rail. These marks indicated where the last pair of wheels with broken flanges left the rail. The distance from the last mentioned spike mark to a point in the track opposite where the trucks of the eighteenth car were found was 339 feet or a total distance of 354 feet west of the first spike mark, which latter mark indicated where the first pair of wheels with broken flanges left the rail. The forward trucks of the B. & O. car were found about 25 feet from the track, on the left side, and about 10 feet to the rear of the head end of the body of the car. The rear trucks were about 13 feet from the track, opposite the rear end of the body of the car.

Examination of the trucks which had been under B & O. car 147716 showed that the left forward wheel of the forward truck had 29 inches of the flange broken off. This wheel, No. 180548, was cast in January, 1910, by the Butler Car Wheel Company, of

Butler, Pa., and had a stenciled weight of 750 pounds. A seam one-fourth inch in depth and 1-1/2 inches in length was found in this wheel. The other three wheels in this truck were of the same weight and manufacture. The left forward wheel of the rear truck of this car was found to have 59-1/2 inches of the flange broken off. This wheel, No. K 68309, was cast in October, 1906, by the Chicago, Milwaukee & St. Paul Railway and carried no weight marks. It appeared, however, to be lighter than the wheel on the opposite end of the axle, No. M 11089, which was also cast in October, 1906, by the Chicago, Milwaukee & St. Paul Railway, and was branded as weighting 875 pounds. This wheel, No. K 68303, also differed from its mate in not having a reinforced flange. In the throat of the flange was a seam about one-fourth inch in depth and 3 inches in length. Thirteen pieces of broken flange were found under the rear of the train, nearly all of which matched and nearly covered the 79-1/2 inches of flange missing from wheel K 68303. Thirteen pieces of flange were also found in the same vicinity which failed by about 22 inches to cover the 59 inches of flange broken from the left wheel of the forward truck, wheel No. 16994B. Careful examination of the track was made from the point of derailment to Avery, a distance of 11.3 miles, but no additional fragments of broken flange were found.

The records indicated that B. & O. car 147716 reached Avery at 6:15 a.m., November 17th, leaving there at 8:03 a.m. in train and No. 49. Car Inspector Thompson stated that he inspected the car at that point and that he did not discover any defects. Avery is a division point located at the foot of the Bitter

Root Mountains, on which there is a grade of 2.2 per cent. The wheel inspection at this point is therefore very rigid and the records of the railroad company indicate that about 100 pairs of wheels are changed each month, about half of which because of worn flanges, there being handled an average of 400 cars per day.

But notwithstanding the character of the inspection service on this division, the records of the railroad company show a considerable number of failures, as having occurred, in which broken flanges have been the cause of derailments.

One feature of prominence appears in a number of these cases, namely, that pertaining to the depth of the chill in the treads of the wheels which have failed. The depth of chill has been found very shallow. In the present derailment the depth of chill was $1/4$ inch. Other instances have presented themselves in which only $1/8$ inch depth has been found and, in extreme cases, only $1/16$ inch of chilled iron was present in the treads of the broken wheels.

This accident was caused by a broken wheel and the records point to a source of trouble which should be carefully considered, and the use of wheels which are in a weakened state guarded against.