IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE OREGON SHORT LINE RAILROAD NEAR WATERFALL, WYO., ON OCTOBER 6, 1923.

On October 6, 1923, there was a head-end collision between two freight trains on the Oregon Short Line Railroad near Waterfall, Wyo., which resulted in the death of two employees and the injury of three employees.

Location and Method of Operation

This accident occurred on the First Sub-division of the Utah Division, extending between Granger and Montpelier, Wyo., a distance of 115.1 miles; in the vicinity of the point of accident this is a single-track line over which trains are operated by time-table, train orders, and an automatic block-signal system. The point of accident was about 1 mile west of Waterfall; approaching this point from the east there are 1,416 feet of tangent, and then a curve of 3 degree 03' to the right which is 860 feet in length, the point of accident being on this curve 370 feet from its eastern end. Approaching from the west there are 1,236 feet of tangent, followed by the curve on which the accident occurred. The grade from the east is ascending, varying from 0.22 to 0.48 percent; from the west it is generally descending for some distance, the maximum being 0.52 percent.

On the inside of the curve on which the accident occurred is a bluff 60 or 70 foot in height, the base of which is within a few feet of the track, this bluff restricting the range of vision of approaching engine crews to a few car lengths.

The signals involved are of the one-arm, lower quadrant, two-position type. The last westbound automatic signal is signal 339, located at the west switch at Waterfall, 4,138 foot east of the point of accident. Eastbound signals 372 and 358 arc located 12,931 and 6,135 feet, respectively, west of the point of accident. An overlap in the control of signal 339 extends to a point 1,563 feet west of signal 358, while the control of signal 358 extends to signal 339. This arrangement precludes the possibility of two opposing trains entering the block simultaneously under clear signal indications.

The weather was foggy at the time of the accident, which occurred at about 7:40 a.m.

Description

Eastbound freight train extra 2536 consisted of 62 cars and a caboose, hauled by engine 2536, and was in charge, of Conductor Nicklo and Engineman Sturman. At Kemmerer, the last open office, 6.1 miles from Waterfall, the crew received a copy of train order No. 20, Form 19, reading as follows:

Engs 2536 and 2539 run Extra Kemmerer to Granger and have right over Extra 2545 West Kemmerer to Opal take siding not pass Opal unless Extra 2545 West has arrived Extra 2536 wait at end double track Kemmerer until seven fifteen 7:15 a.m. Waterfall until seven thirty 730 a.m. Folgor until seven forty 7:40 run Extra 2539 East wait at end double track until eight one 8:01 a.m. Waterfall until eight fifteen 8:15 a.m. Folgor until eight twenty three 8:23 a.m. for Extra 2545 West.

Extra 2536 left Kemmerer at 7:25 a.m. 10 minutes after the time named in the order, and was approaching Waterfall at speed estimated to have been about 25 miles an hour when it collided with extra 2545.

Westbound freight train extra 2545 consisted of 71 cars and a caboose, hauled by engine 2545, and was in charge of Conductor Bristol and Engineman Richards. It passed Opal, the last open office, 9.1 miles from Waterfall, at 6:51 a.m. receiving at that point a copy of train

order No. 20, Form 19, previously quoted, and arrived at Waterfall at 7:15 a.m., entering the side track and taking water. At this point train order No. 23 was received over telephone direct from the dispatcher by the head brakeman, there being no open office at this point, this order read as follows:
Ex 2539 East wait at end double track Kemmerer 8:10 am for extra 2545 west.

According to the dispatcher's train order book this order was issued on Form 19, however, the head brakeman copied it on a Form 31 blank, Extra 2545 departed from Waterfall at about 7:33 a.m., three minutes after the time extra 2536 was due under the wait order, and collided with that train while traveling at a speed estimated to have been about 8 miles an hour.
Both engines remained upright, although derailed and considerably damaged. Thirteen cars in the two trains were demolished, and 13 others were more or less badly damaged. The employees killed were the engineman of extra 2545 and the fireman of extra 2536.

Summary of Evidence
On arrival at Waterfall extra 2545 headed in on the passing track for the purpose of meeting the two eastbound extras. After the train had been brought to a stop, Head Brakeman Crosby uncoupled the engine, and it proceeded a short distance away to take water. Conductor Bristol performed work on his delay report and time slips, then went up into the cupola of the caboose to listen for the eastbound extras, and not hearing them he got down and started toward the head end of the train, intending to communicate with the dispatcher in an endeavor to obtain more time on the opposing trains. Head Brakeman Crosby, however, had communicated with Dispatcher Durham from the telephone booth, and accepted train order No. 23. As soon as the engine returned to the train, the head brakeman recoupled it, and, after testing the air brakes, the train departed at about 7:32 or 7:33 a. m. At this time Conductor Bristol, according to his own statement, was some distance back from the head end perhaps 30 or 35 car lengths, but instead of taking action to bring the train to a stop and ascertain the reason for its departure against an opposing superior train, he got aboard, and proceeded over the tops of the cars to the engine, which by that time was within 15 or 20 car lengths of where the accident occurred, where he maintains someone informed him, or the remark was made, that the opposing train would wait at the end of double track at Kemmerer until 8:10 a.m. Conductor Bristol did not know which of the two opposing trains was to wait until this time, and did not ask the brakeman or fireman for more definite information, thinking he would receive it from the engineman just as quickly, and also because he wanted to sec the order itself; he said Engineman Richards was then out on the running board, working on the sanders. As the train was approaching the point of accident Engineman Richards started to return to the cab, but as he was about to got into it he was soon to look ahead and then jumped from the engine, Conductor Bristol having just about time in which to brace himself before the accident occurred. Conductor Bristol said the reason he did not take action to bring the train to a step and ascertain from Engineman Richards on what authority they were moving against an opposing superior train was because he had implicit confidence in the engineman's ability, and did not want to interfere with his handling of the train; as it was, he had not seen the order up to the time the accident occurred.

Fireman Anderson knew his train headed in at Waterfall for the purpose of meeting the two opposing extras, in compliance with train order No. 20; after the engine was recoupled to

the train he saw head Brakeman Crosby hand Engineman Richards what he thought was a train order, and on seeing the head brakeman proceed toward the switch he asked the engineman if they were going to depart, but made no effort to ascertain the contents of the order, and he said it was not shown to him, nor was he informed of its contents, saying that he was busy on the fire when the engineman boarded the engine with the order, and that by the time he had finished with this work the engineman was out on the running board. While Fireman Anderson at one time said Engineman Richards had left the cab before the conductor reached it, his later statements indicated that he was not sure on this point, although he was able to say that the first time he noticed the conductor's presence was after passing the eastbound distant signal, or more than half way between the west switch and the point of accident.

Head Brakeman Crosby said that when the engine had been coupled to the train after taking water, he asked Engineman Richards if he should got in touch with the dispatcher, and that the engineman gave him a pencil which he took with him to the telephone booth, and on calling the dispatcher and giving him the number of the train the dispatcher sent the train order in question, without asking for his name. Having forgotten the numbers of the opposing extras, the head brakeman did not know whether this order gave his train more time on the first or the second of the opposing trains. He returned to the engine, gave the order to the engineman who was on the ground beside the engine, went ahead to open the switch and gave the engineman a signal to proceed, at about which time he noticed that the block signal was displaying a clear indication. The head brakeman left the carbon copy of the order in the switch lock to be picked up by the flagman, boarded the engine as it passed him, and said that Conductor Bristol, whom he had seen walking along the ground beside the train, apparently boarded it near the head end and proceeded to the engine over the tops of the cars, reaching the engine at or soon after the time it passed the switch. Although Head Brakeman Crosby was not positive whether Engineman Richards handed the order to Conductor Bristol or held it up for him to read, he said he knew that the conductor read the order, and that it was after all this had taken place that the engineman went out on the running board to work on the sanders. Head Brakeman Crosby said he then went back into the tender and was engaged in knocking down coal when the accident occurred.

Flagman Parks stated that on leaving Waterfall, he found a copy of train order No. 23 in the switch lock; after closing the switch and getting back in the caboose he read the order, and just as he finished reading it the accident occurred.

Members of the crew of extra 2536 stated that the fog at times restricted vision to 3 or 4 car lengths, while the maximum range of vision was about 15 car lengths, Engineman Sturman and Head Brakeman Jonely emphatically stated that signal 358 was displaying a clear indication at the time their train passed it, Engineman Sturman also saying that Fireman King called to him that the block was clear. Engineman Sturman explained his receiving a clear indication at signal 358 by saying both trains must have entered on the track circuit at the same time. He fixed the time of the departure of his train from the end of double track at 7:25 a.m., and the time of the accident at about 7:43 a.m. Head Brakeman Jonely saw extra 2545 when it was approximately 200 feet distant and said the air brakes on his own train were applied in emergency just before the accident occurred. Conductor Nickle estimated the speed to have been between 10 and 15 miles an hour through the yard limits at Kemmerer, and between 20 and 25 miles an hour from the yard-limit board to the point of accident; those estimates were substantially the same as those of Engineman Sturman. Conductor Nickle was of the opinion that his train passed signal 358 while it was displaying

a stop indication. The statements of the various members of the crew indicated that their train consumed about 18 or 19 minutes between the end of double track at Kemmerer and the point of accident, a distance of more than 4 miles, the first three of which were within yard limits.

While there is a disagreement between the statements of Dispatcher Durham and those of Head Brakeman Crosby as to the nature of the conversation which passed between them, Dispatcher Durham admitted that he did not inquire as to the identity of the person with whom he was talking. assuming it to be Engineman Richards. Dispatcher Durham said train order No. 23 was issued to extra 2545 at Waterfall at 7:31 a.m., and that it was 7:42 a. m., when the accident occurred, this being the time he heard a roar on the telephone apparently caused by wreckage being thrown across the wires.

Shortly after the accident signals 339 and 358 were soon displaying stop indications; the mechanisms were at once sealed, and subsequent tests showed them to be in proper working order.

Conclusions

This accident was caused by the failure of the crew of extra 2545 to remain at Waterfall until extra 2536 arrived, and by the failure of Engineman Sturman, of extra 2536, properly to observe and obey automatic signal indications.

Head Brakeman Crosby assumed the duty of conductor and accepted from Dispatcher Durham train order No. 23, which gave his train additional time against extra 2539, which was the second of the opposing extras, but said that as he had forgotten the engine numbers of those trains he did not know whether this order helped his train against the first or second extra. Head Brakeman Crosby delivered this order to Engineman Richards, who departed from Waterfall without awaiting the arrival of extra 2536, the first of the opposing trains. Conductor Bristol permitted the train to depart without making an effort to ascertain the authority for the movement, while Fireman Anderson made no attempt to acquaint himself with the contents of the order.

The east yard-limit board at Kemmerer is 3 miles east of the end of double track and within less than 200 feet of eastbound signal 358, which as previously stated is about 1-1/4 miles from the scene of the accident. According to Engineman Sturman's statements his train left the end of double track at 7:25 a. m., and proceeded the distance of 3 miles to the yard-limit board at a speed not exceeding 15 miles an hour, after which he increased the speed to about 20 or 25 miles an hour. With this train operated in this manner it could not have passed signal 358 prior to 7:35 a.m., while in view of the fact that the speed was increased between this point and the point of accident, a distance of only 1-1/4 miles, and the further fact that the accident occurred not later than 7:43 a.m., it appears probable that 7:40 a.m. would be much nearer the actual time at which the signal was passed. In as much as extra 2545 started to pull out of the side track at Waterfall not later than 7:35 a.m. it would appear that signal 358 had been displaying a stop indication for at least 5 minutes before it was passed by extra 2536, and that Engineman Sturman failed to observe this indication correctly.

The employees involved were experienced men and 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.

The facts of this accident again forcibly disclose the necessity for automatic train-control. This necessity has been pointed out for many years in many previous accident investigations on this and other lines. In Automatic Train Control Devices, 69 I. C. C., 258, docket No. 13413, decided June 13, 1922, Mho Commission said:

"our investigations have shown that the art of automatic train control has long since passed the experimental stage"
The 15 years of investigation and study and the results obtained in the actual employment of these devices over periods of years upon some of the railroads have clearly demonstrated, the practicability of and the necessity for automatic train-stops or train-control. The time has now arrived when the carriers should be required to select and install such device or devices as will meet our specifications and requirements.

The accident reports made by the railroads to us show that from January 1, 1906, to December 31, 1921, there were 26, 297 head-on and rear-end collisions. These resulted in death to 4,326 persons and injury to 60,682. The damage to railway property alone amounted to $40,969,663. The annual average of those collisions amounted to 1,613; the average number killed, 270; and the average number injured, 3,792. The average damage to railroad property amounted to $2,560,603 per year. Losses due to damage to lading are not included in these figures but they are no doubt considerable. If to the large property losses there be added the death losses and the damages paid for persons injured, the total amount will be very great. As an indication of what these latter losses are, a number of carriers have furnished us with the death and personal injury claims paid by then as a result of a number of accidents."
The Commission in its 37th annual report to Congress, dated December 1, 1923, reported that out of 82 collisions investigated by the Bureau of Safety during the fiscal year ended June 30, 1923, 75, or over 91 per cent, probably would have been prevented if an adequate system of automatic train-control had been in use; in these 75 collisions 189 persons wore killed and 1,299 injured. The accident hereunder investigation is but another in the ever lengthening list of accidents which could have been prevented had the railroad company installed and had in proper operation an automatic device designed to stop the train in the event the engineman failed to do so.