BRIDGEPORT ACCIDENT

Report of H. W. Belnap, Chief Inspector of Safety appliances, to the Interstate Commerce Commission.

August 16, 1911.

Interstate Commerce Commission,

Washington, D. C.

Dear Sirs:

On July 11, 1911, train No. 72, Federal Express, eastbound, on the New York, New Haven & Hartford Railroad, was derailed near Bridgeport, Conn. The message reporting the accident was received by the Commission the following morning.

I was in New York City at the time, and shortly after noon received a long distance telephone communication from Commissioner McChord relative to the accident, and realizing its magnitude and the importance of a thorough investigation, I immediately went to Bridgeport, arriving on the scene of the accident at 5:00 p. m., July 11, and had opportunity to look over the wreck, and all the signals involved before very much of the wreckage had been removed and before the track had been repaired. It would have been impossible to have been on the scene of the accident as promptly had it not been that extra editions of the press contained reports of the accident, which furnished the information on which we acted.

A proper compliance with the order of the Commission of June 21, 1911, requiring railroads to give notice by telegraph immediately after the happening of the accident would have placed such message in the office of the Commission shortly after 9 a. m., on the morning of July 11, 1911.

At 3:32 a. m., July 11, 1911, the east bound Federal Express, known as train No. 72, on the New York, New Haven & Hartford Railroad, consisting of engine 813, Department of Commerce & Labor Fish Commission car No. 4, Pennsylvania Railroad baggage car No. 5528, New York, New Haven & Hartford Railroad day coach No. 518, and six Pullman sleepers, was derailed, with the exception of the

last two sleepers, at the crossover known as Burr Road crossing, about one and one-half miles west of Bridgeport, Conn. This derailment resulted in the death of the engineman, fireman, one employee not on duty, and eleven passengers, and the injury of forty passengers, many of them seriously. The greater number of fatalities were in the day coach. Train No. 72 left Harlem River, its western terminal, at 1:52 A. M., 57 minutes late. The engine was in charge of Engineman Curtis and Fireman Ryan, and the train made eleven stops between Harlem River and the place of the accident, which would indicate that the air brakes were in good working condition.

After the derailment, the engine and cars destroyed the south girder of an 85-foot span steel bridge that crosses Fairfield Avenue, ran along on the ties and the ground until overturned, and were thrown down an embankment into the street below. The engine lay more than 400 feet from the point of derailment, which indicates the high speed at which the train was running at the time of the accident.

This section of the New York, New Haven & Hartford Railroad is equipped with controlled manual block signals, which the evidence and investigation show were in good working condition. Train movements are governed by the signals displayed and train orders are not used (except in case of moving a train against the current of traffic.) The engineman can tell by the signal displayed which track his train will use, whether it shall stop, proceed on the same track, or diverge to another track or route. From time to time, to facilitate the movement of trains, it is necessary that their route be changed from track to track as conditions of traffic require. These crossover movements are directed by the train dispatcher, who notifies the tower signalman when he shall divert a train from one track to another. Train No. 72, with nine cars, was received by the dispatcher on this district on track No. 2, closely followed by fast mail train No. 34, with six cars, which was received on track No. 1, the intention being for train No. 34 to pass train No. 72, which it did before reaching Bridgeport. Train No. 72 had Department of Commerce & Labor Fish Commission car No. 4 to leave at Bridgeport, and to set out this car it was necessary that train No. 72 be on track No. 4. Some ten or fifteen minutes prior to this accident the train dispatcher directed the operator at Burr Road tower to divert train No. 72 from track No. 2 to track No. 4. The accident occurred at this crossover, and the switches and signals governing the crossover had been set and locked for this train before its arrival, to enable the train to leave track No. 2 and continue on

track No. 4.

This crossover is governed by semaphore signals which are in plain view of the enginoman of an approaching train. In addition to these semaphore signals, a dwarf signal, located near the switch, indicates whether or not a crossing is to be made.

The interlocking plant is not equipped with approach locking to prevent signalmen from changing the switches of a route while a train is closely approaching them. While all the evidence shows that the absence of approach locking did not in any way contribute to this accident, it might, in case of confusion of the signalman, result in trains being improperly diverted after switches and signals had been set for them to proceed on the main track and might be the means of causing similar accidents.

The New Haven roadbed in this locality is on a fill, and carries four main tracks laid with 100 lb. rail on stone ballast, very well constructed and maintained. Located on a tangent, bounded on the west by a 37 minute curve and on the east by Fairfield Avenue bridge, 85 feet in length (through plate girders, tie floor), is a standard No. 8 double slip ladder switch extending across all four tracks and installed to serve an important industrial track, which leads facing off track No. 4 east of Fairfield Avenue bridge to the street level where manufacturing plants are located. The design and construction of the track, switches, movable points, frogs and other appurtenances of this slip ladder switch, which is in effect a combination of a straightaway connection from track No. 3 clear across the four tracks to track No. 4 with three crossovers between adjacent tracks, is good and substantial, and no portion of the track structure failed until after, and as a result of, the derailing of wheels of train.

The rather scant difference in grade between Fairfield Avenue and the railroad track itself at Fairfield Avenue bridge, and considerations of safety in case of damage to the structure by derailment (a street railway line crossing the right-of-way under this bridge), evidently led to the use of through girders rather than deck girders on this bridge, and to the placing of girders between all tracks, which construction prevents the installation of crossovers on the bridge itself; and this means that the easterly end of any crossover located west of the bridge could not be farther east than the easterly line of the bridge itself. The No. 8 double slip ladder used takes up

practically all the available tangent west of Fairfield Avenue bridge; hence, any longer crossover would extend so far west as to compel its location partly on the curve west of the tower. The lowest numbered crossover that can be reasonably expected to carry trains safely at 60 miles per hour is an 18 or a 20. If such crossovers were used in place of the No. 8 double slip ladder, they would, of necessity, extend out on to the curve a distance of about 1000 feet. When a crossover is located upon a curve having a given superelevation of the outer rail, one half of the crossover will have this same superelevation in the right direction, and the other half will have it in the wrong direction. On account of this superelevation in the wrong direction, the likelihood of derailment in operating over crossovers located on curves is so great as to lead railroads to use every effort to locate their crossovers on straight track.

The New York, New Haven & Hartford Rail road Company restricts the speed of trains both by signals and by rule when taking crossovers. On one type of crossover, known as a straight crossover, the speed is restricted to 25 miles per hour or less; on another type, known as a slip crossover, such as was used at Burr Road, speed is restricted to 15 miles per hour or less. Timecard rule No. 2 reads as follows:

> "Trains while passing through slip switches must not run at speed to exceed fifteen (15 miles per hour.
>
> "At crossovers, except where speed is restricted to less, no train must exceed a speed of twenty-five (25) miles per hour while passing through crossover from one main track to another."

In addition to this rule, train movements over these crossovers are governed by signals that indicate to the enginemen the speed permitted while making the crossover movement. Crossovers on which a speed of twenty-five miles per hour is permitted, are governed by high semaphore signals; crossovers on which a speed of but 15 miles per hour is permitted, are governed by dwarf signals, located on the ground near the switch-points of such crossovers.

The distant signal at Burr Road crossover was set at caution; the home signal was set at danger, and the dwarf signal was set so as to indicate to the approaching train that it was to cross over from track No. 2 to track

No. 4. The distant signal is located 2187 feet west of the home signal. The home signal can be distinctly seen from the distant signal, but on approaching the crossover the view is obstructed for a short distance by a large tree until within about 1000 feet of the home signal, from which point the view is clear again. The dwarf signal can be plainly seen a distance of more than 650 feet.

Investigation shows that Mr. Curtis, the Engineman, Mr. Ryan, the Fireman, and Mr. Hemingway, the Towerman, had none of them been on duty longer than the time permitted by the Federal statute. Mr. Curtis, the Engineman, had been off sick with the measles in April, but had apparently entirely recovered and he had reported and gone on duty some three weeks prior to this accident. The service records of all these employes are good and they were considered thoroughly reliable and competent men.

Mr. Curtis had been in the employ of the New York, New Haven & Hartford Railroad Company on this division since October 24, 1897. He was promoted to an engineman in November, 1904, had handled this particular train before, and had handled other fast passenger and freight trains over this division. He was familiar with the rules, tracks and signals at the place of the accident.

The accident was caused by the train crossing from track No. 2 to track No. 4 at a high rate of speed, estimated at between 55 and 60 miles per hour.

Why the engineman should disregard both the signals and the rule governing this crossover, and not control the speed of the train while crossing from track No. 2 to track No. 4, knowing that Department of Commerce and Labor Fish Commission car No. 4 was to be set out at Bridgeport, and this crossover was the only place left that such crossing from track No. 2 to track No. 4 could be made before reaching Bridgeport, it is a question as to which there is now no evidence, and any attempted explanation would be a mere matter of conjecture.

The distance the engine went after the derailment indicates unquestionably the high rate of speed of the train. This is fortified by the concurrence of the direct testimony of all witnesses.

High speed was permissible and safe if the train was to have continued on track No. 2. This speed, however, was manifestly dangerous when a crossover was to be made, as in the case of this train.

The speed of the train was in the sole control of the engineman. If he knew that the crossover was to be made at this point, he should have reduced speed to 15 miles an hour or less. There is no direct evidence that he knew that the crossover was to be made at this point. He did know that the Department of Commerce & Labor Fish Commission car was to be left at Bridgeport. He was familiar with the tracks at this point, and knew that this was the last crossover which would permit the train to reach track No. 4 before reaching Bridgeport.

As he was approaching this point, even if he had no knowledge of the necessity of crossing over from track No. 2 to track No. 4, it still remains true that at the time he was within 2,200 feet of the point of derailment (if he was conscious) he must have realized from the signals which were displayed that he must either stop before passing the home signal, or prepare to take the crossover, and that in using the crossover, by the rules and signals displayed, he must reduce his speed to fifteen miles per hour or less.

It is probable that if a No. 18 or 20 crossover had been used at this point, train No. 72 would not have been derailed while passing over it at 60 miles an hour. It is, however, unreasonable to suppose that physical conditions will not frequently exist upon railroads where the use of such long crossovers is not practicable for the purpose of diverting trains from one track to another at maximum speed, with safety, just as it is impracticable that any railroad should not have in its main track any curves over which trains might not be operated at maximum speed with the same safety as on straight track. Long crossovers are introduced primarily to save time in crossing over, as the speed reduction necessary to take short crossovers causes delay. As regards overturning, the same conditions apply to facing turnouts at junction points or leading into sidings or yards, as apply to crossovers, but it is apparent that in entering sidings at high speed the danger from collision with cars standing on the siding is greater than the danger of derailment; hence, the use of long turnouts for entering sidings would tend to eliminate a smaller percentage of accidents than would the use of long turnouts in main line crossovers. While it is urged that as an extra precaution all crossovers used for diverting trains from one main track to another in the direction of traffic should be long enough to reduce to a minimum the risk of overturning if they are taken at high speed, the proper thing to do is to prevent

the high speed where it ought not to be used. This can be accomplished by the use of automatic train control apparatus, with proper speed control features. From the present rate of progress being made in the development of such devices, it is apparent that it is going to be some time before railroads are thus equipped, and until such installations are in use, railroads should require that whenever a train is to be diverted from one main track to another upon which the current of traffic is the same, at any crossover less than say No. 18 or 20, the switches shall be left as set for the straight route, stop ~~dix~~ signals displayed, and crossover shall not be set for the diverging movement until after the train which is to make the movement has stopped.

As a result of the investigation, the following facts are disclosed:

(1) This accident was caused by a disregard on the part of the enginemen of signals and rules provided by the railroad company to prevent the occurrence of such accidents.

(2) The signals and rules provided by the railroad company for the prevention of such accidents were adequate had they been observed.

(3) The tracks and switches were substantially constructed and safe for the train movement made had the rules been observed.

(4) The interlocking and block signalling apparatus performed their intended functions and were properly handled, though no approach locking was installed.

(5) While the accident was due, as stated, to disregard by the enginemen of the rules and signal indications, it is probable that the disastrous consequences of such disregard of rules and signals might have been prevented had it been reasonably practicable to have installed a No. 18 or No. 20 crossover instead of a No. 8 slip, and had same been used at this point.

As a preventive of such accidents, it is recommended

(1) That in all situations where accidents are likely to occur through the non-observance by enginemen of signals or rules calculated to insure safety, automatic train control apparatus should be provided to insure that trains will be brought to a stop in case the signals or rules are not properly observed.

(2) That in the absence of such automatic control apparatus, on tracks where high speed trains are run, switches should not be set to divert a high speed train from one track to another at a crossover which is not safe for high speed until after the train has been brought to a stop.

(3) That at all interlocking plants where trains are operated at high speed over facing switches, approach locking should be provided to prevent the switches being changed from the main or through route to a diverging route after a train has received the signals for the through route.

Respectfully submitted,
H. W. BELNAP,
Chief Inspector of
Safety Appliances.